

Installation • Operation Manual

Natural Gas (NG) - Factory Default

Liquid Propane Gas (LPG) - Optional Orifice

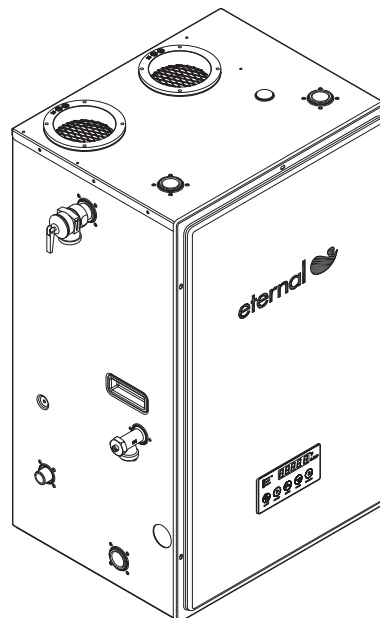
Model GU145 (S) / 508(11,12,21,22)1145 (S)

Model GU195 (S) / 508(11,12,21,22)1195 (S)

Model GU195 (M) / 508(11,12,21,22)1195 (M)



Quality
ISO 9001



Service Information Center:

Call us first if you have any questions with this product. We can help you with questions about assembly and Water Heater operation or if there are damaged or missing parts when you unpack this unit from the shipping box. Please call before returning to the store.

(800)461-4657

8am-5pm EST, Monday through Friday

IMPORTANT:

- **Only specially trained and authorized personnel are permitted to service this water heater.**
- **NOTE TO ASSEMBLER / INSTALLER:**
Leave this manual with the consumer.
- **NOTE TO CONSUMER:**
Keep this manual for future reference.
- **RECORD YOUR SERIAL #** _____
(see silver CSA label on Gas Water Heater)



WARNING



Read this Operator's Manual carefully and be sure your Water Heater is properly assembled, installed and maintained. Failure to follow these instructions exactly could result in a fire or explosion, serious bodily injury and/or property damage.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.



WARNING



California Proposition 65 lists chemical substances known to the state to cause cancer, birth defects, death, serious illness or other reproductive harm. This product may contain such substances, be their origin from fuel combustion (gas, oil) or components of the product itself.



WARNING


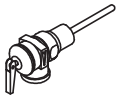




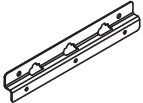
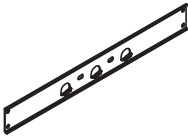





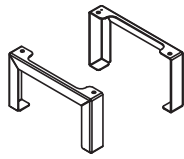


Only a licensed professional can install Eternal units for safety and code compliance. Venting and plumbing codes can vary by location. Installation instructions and all applicable codes must be followed or property damage, severe injury, or death can result. Failure to use a licensed plumber or contractor, follow venting, plumbing, and building codes; or follow installation instructions may be unlawful and will void the product warranty. Grand Hall is not responsible for any costs incurred for repairing any problems resulting from failure to follow installation instructions or applicable codes.

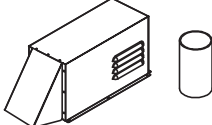
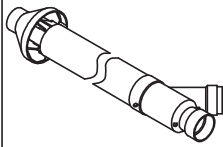
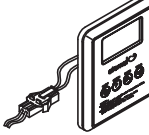


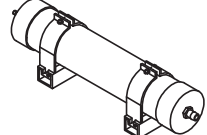

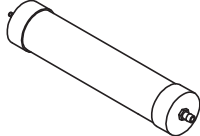
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Included Accessories

P/N	Item	Description	Qty	P/N	Item	Description	Qty
508111145(S) 508111195(S) 508111195(M)	GU145(S) GU195(S) GU195(M) Eternal Hybrid Condensing Water Heater		1	194140151	T&P Relief Valve		1
				305070273	Drain Valve Assembly		1
157140081 157010178	Operating and Installation Manual Registration Card	 	1	151140097	Mesh Screen		2
314070066	Mounting Bracket Assembly	 151140066 Mounting Bracket x2pcs  151140067 Wall Bracket x1pcs  190006019 1/4"x1 1/2" screws x6pcs	1	150150028	LP Orifice		1
				195140195	T-Fitting (for condensate line)		1
				312070025	EC Adapter		1
157010126	Propane Gas Label		1	314080136	Water Heater Stand	 Philips Head Screw M8x15 : 4pcs Stainless Steel Expansion Bolt : 4pcs	1

Optional Accessories

P/N	Item	Description	Qty	P/N	Item	Description	Qty
314070074	Outdoor Venting Cap		1	ECHCVT01	Concentric Kit		1
312070039	Remote Controller Kit	 0.75mm*2C Wire  Hole Plug : 1pcs  Self Tapping Screw Cap : 2pcs 5/32" x 5/8" : 2pcs	1	ECHNK01	Eternal Condensate Neutralizer Kit		1
151140130	Horizontal Terminator 3"		1	ECHNR01	Eternal Condensate Neutralizer Refill		1

Eternal Hybrid Water Heater Technical Specifications							
Model Name		GU145 / GU145(S)			GU195(S) / GU195(M)		
Thermal Efficiency (*) / Energy Factor		98% NG / 99% LP / 0.96 Energy Factor					
Installation		Indoor / Outdoor / Wall Hung / Floor Standing					
Flue System		Sealed Combustion Direct Vent / Power Vent Convertible					
Vent Run	76.2mm(3") PVC / 50.8mm(2") PVC		Up to 30m(100ft), 6 Elbows Max, 1.5m(5ft) Deduction Per Elbow / Up to 10.5m(34.44ft), 3 Elbows Max, 1.5m(5ft) Deduction Per Elbow				
Condensate Discharge	Low Fire / Med Fire / High Fire		1.9LPH (0.5GPH) / 4.2LPH (1.1GPH) / 6.6LPH (1.75GPH)				
Condensate pH Level			4 pH				
Gas Type			Pre-set for NG / LP Conversion Kit Included				
Unit Connections	Gas and Water		19.05mm (3/4") Female NPT				
	Electricity		Dedicated 120VAC, 60Hz w/3 Pronged Power Cord				
Gas Input Rate	Min / Max		9.1 kW (31,000 Btu/hr) / 42 kW (145,000 Btu/hr)			9.1 kW (31,000 Btu/hr) / 58.3 kW (199,000 Btu/hr)	
Gas Supply Pressure	NG / LP		3.5"W.C. (8.7mbar) to 10.5"W.C. (26.2mbar) / 8.0"W.C. (19.9mbar) to 14.0"W.C. (34.9mbar)				
Manifold Pressure (minimum)	Time engineering	NG	(-) 0.02" W.C.			NG	(-) 0.02" W.C.
		PG	(-) 0.02" W.C.			PG	(-) 0.02" W.C.
Ignition System			Direct Electronic Ignition w/Automatic Flame Sensing				
Burner System			Single Orifice Premixed Fuel Injection Metal Fiber Infrared				
Gas Valve System			Dual Stage Negative Pressure Full Modulation Air Ratio				
Internal Piping Material			Stainless Steel				
Reserve Tank			7.6 Litres (2 Gallons)				
Electrical Consumption			Standby 8w, Max 51w			Standby 8w, Max 91w	
Maximum Noise Level			40dB (a)			50dB (a)	
Remote Controller			Up to 3 kits				
Multi Unit Capable			Up to 2 in manifold, No Built - In MCU / M Option - MCU up to 8 Units				
GPM Capacity Range			0.38 to 54.9 LPM (0.1 to 14.5 GPM)			0.38 to 73.8 LPM (0.1 to 19.5 GPM)	
Temperature Sensing			Tank, Cold Inlet, Hot Outlet, Air Thermistors				
Temperature Control			Simulation Feed Forward and Feed Back, Computer Controlled Mixing Valve				
Flow Sensing			Dual Flow Sensors w/Built-in GPM Monitor				
Temperature Settings Range			38°C (100°F) to 82°C (180°F) in 1~2°C (5°F) Steps, Factory Limited to 60°C (140°F)				
Unit Dimensions (WxHxD)			428 x 350 x 739mm (16.9" x 29.1" x 13.8")				
Unit Weight			40.8kg (90lbs) / M Option - 41.5kg (91.5lbs)				
Safety Devices			T&P Valve, Flame Rod, Thermal Fuse(152°C(306°F)), Remaining Flame Detection, Fan RPM Check, Freeze Protection(-15°C(-40°F)), Vent Blockage Detection, Thermostat Switches(75°C/90°C(167°F/203°F)), Gas Valve Current Leak Detection, Ignition Prevention, Dipswitch Temperature Lock, GFCI w/2 x 5A Fuses.				

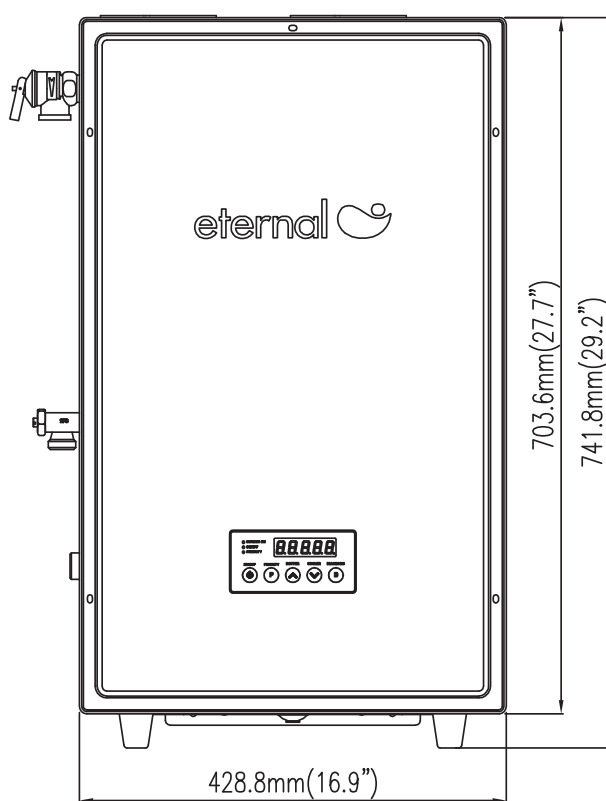
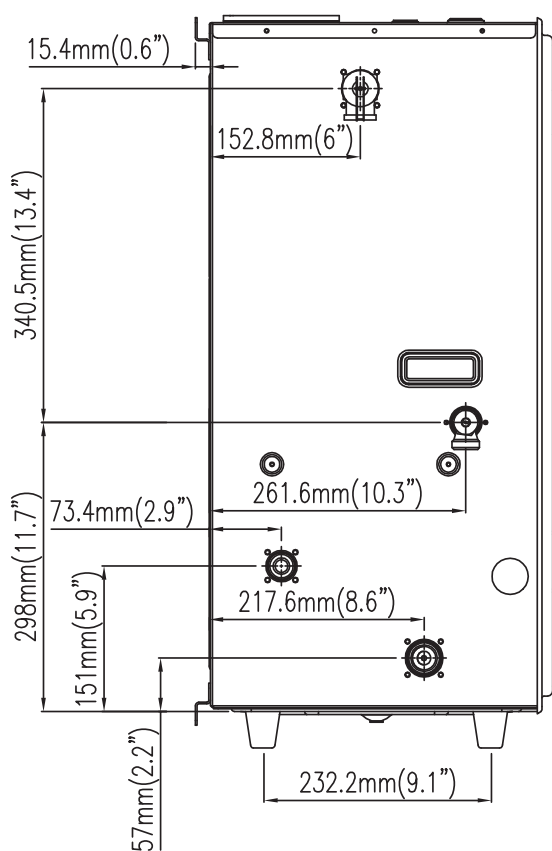
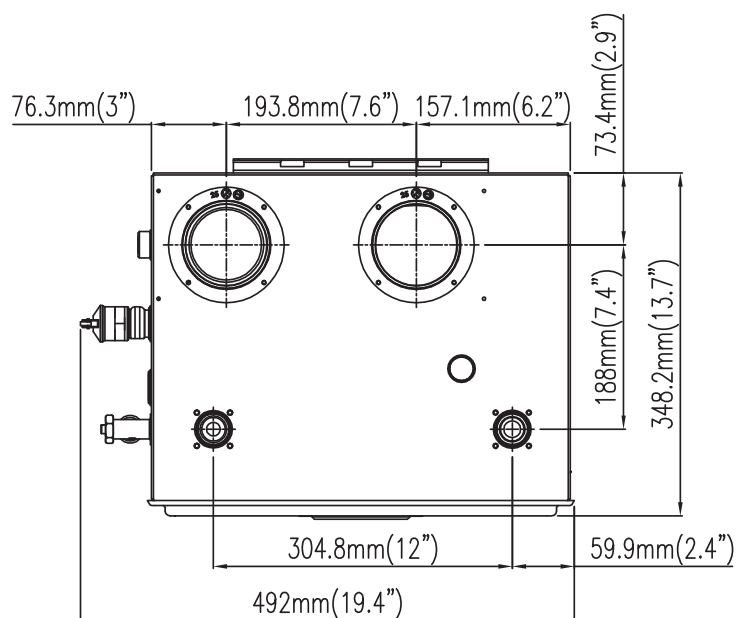
* 50.8mm(2") PVC Cannot be used at elevations above 1,200m(4,000ft)

GU145S and GU195S are for single or dual unit applications with no multi control unit. The GU195M is for multiple unit applications only and cannot be used for single unit applications.

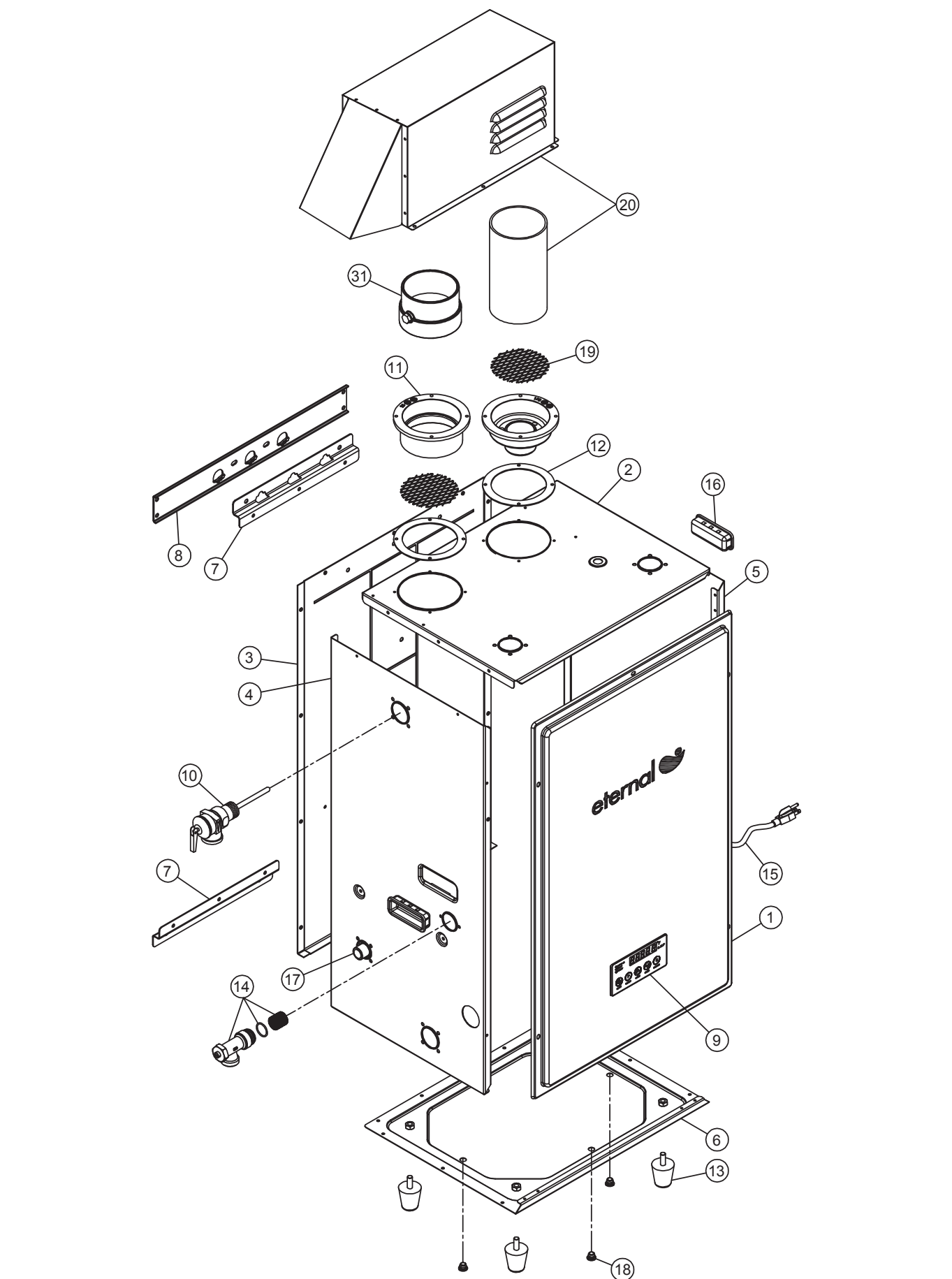
* Maximum manifold pressure is refer to the rating label was attached the right side of unit.

* Independent DOE tested.

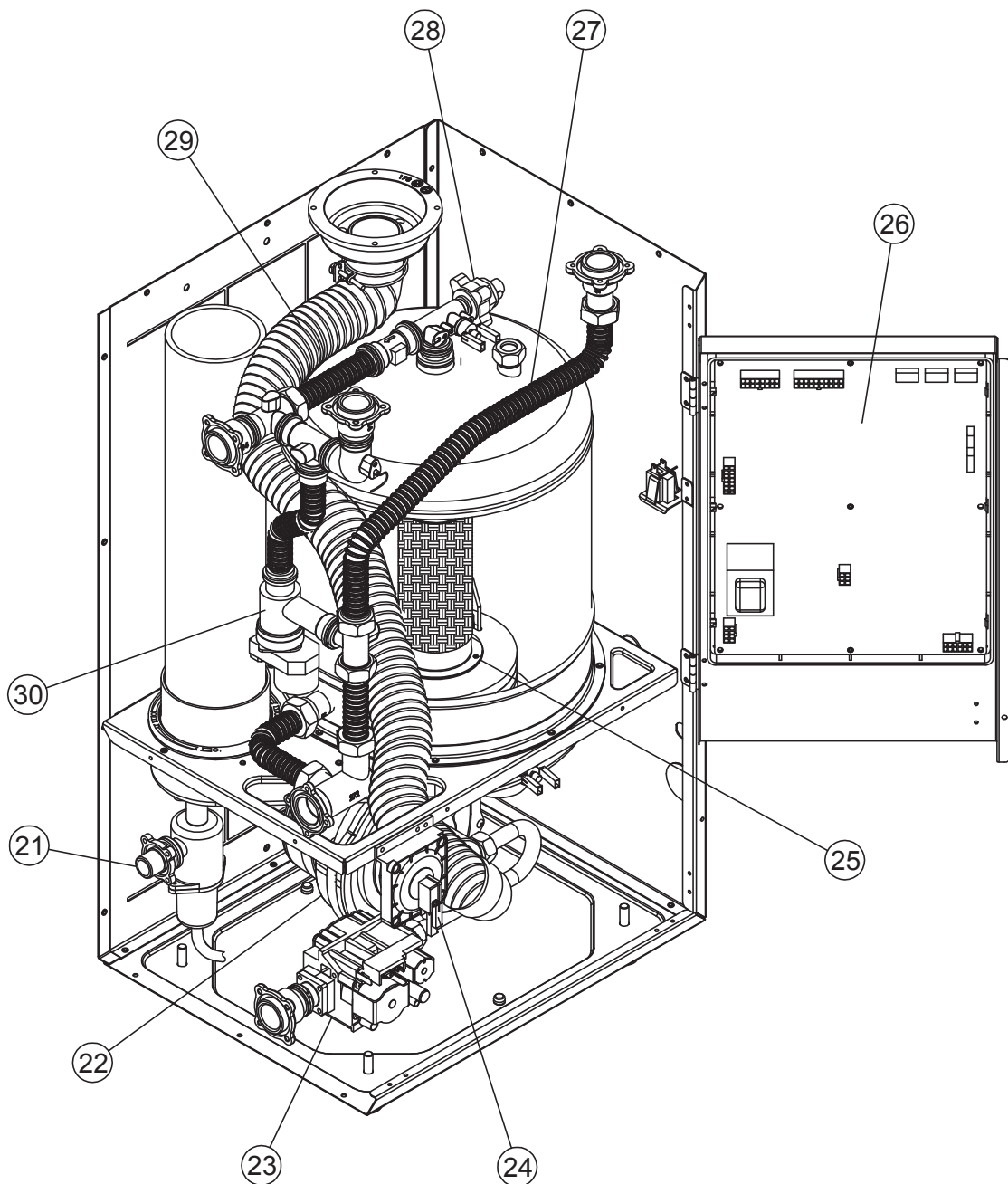
**Dimensions - GU145(S) / 508(11,12,21,22)1145(S)
GU195(S,M) / 508(11,12,21,22)1195(S,M)**



**Parts Diagram for Model GU145(S) / 508(11,12,21,22)1145(S)
GU195(S,M) / 508(11,12,21,22)1195(S,M)**



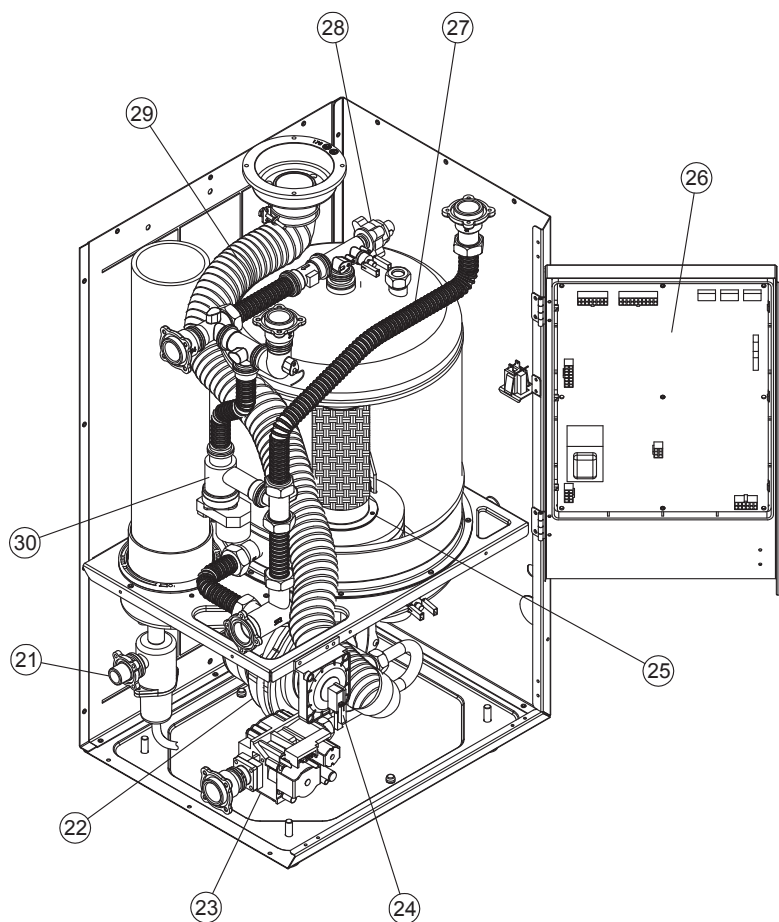
Parts Diagram for Model GU145(S) / 508(11,12,21,22)1145(S)



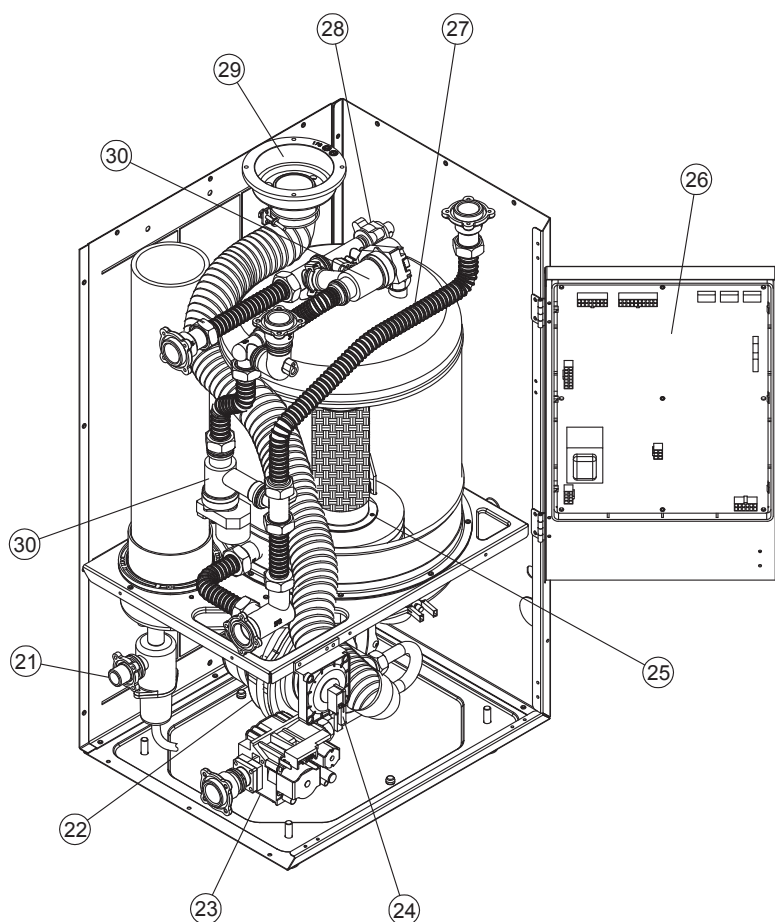
Parts List for Model GU145(S) / 508(11,12,21,22)1145(S)

KEY	DESCRIPTION
1	Panel, Front Assembly
2	Panel, Top / Rear Assembly
3	Panel, Rear
4	Panel, Left Assembly
5	Panel, Right Assembly (GU145(S))
6	Panel, Bottom
7	Mounting Bracket
8	Wall Bracket
9	Controller / Front
10	T&P Relief Valve (Cash Acme)
11	Vent Collar
12	Vent Collar Packing
13	Rubber Foot
14	Drain Valve Assembly
15	Main Power Cord
16	Handle
17	Condensing Nipple
18	Plug
19	Mesh Screen
20	Outdoor Venting Cap (Optional)
21	Trap Cleaner Assembly
22	Radial Blower Assembly
23	Gas Valve
24	Air Pressure Switch (GU145(S))
25	Burner Assembly
26	Main Controller (GU145(S))
27	Cold Water Tube Assembly (GU145(S))
28	Hot Water Tube Assembly (GU145(S))
29	Flexible Silencer Kit
30	Mixing Valve
31	EC Adapter

Parts Diagram for Model GU195(S) / 508(11,12,21,22)1195(S)



Parts Diagram for Model GU195(M) / 508(11,12,21,22)1195(M)



Parts List for Model GU195(S,M) / 508(11,12,21,22)1195(S,M)

KEY	DESCRIPTION
1	Panel, Front Assembly
2	Panel, Top / Rear Assembly
3	Panel, Rear
4	Panel, Left Assembly
5	Panel, Right Assembly (GU195(S,M))
6	Panel, Bottom
7	Mounting Bracket
8	Wall Bracket
9	Controller / Front
10	T&P Relief Valve (Cash Acme)
11	Vent Collar
12	Vent Collar Packing
13	Rubber Foot
14	Drain Valve Assembly
15	Main Power Cord
16	Handle
17	Condensing Nipple
18	Plug
19	Mesh Screen
20	Outdoor Venting Cap (Optional)
21	Trap Cleaner Assembly
22	Radial Blower Assembly
23	Gas Valve
24	Air Pressure Switch (GU195(S,M))
25	Burner Assembly
26	Main Controller (GU195(S,M))
27	Cold Water Tube Assembly (GU195(S,M))
28	Hot Water Tube Assembly (GU195(S,M))
29	Flexible Silencer Kit
30	Mixing Valve
31	EC Adapter

Pre-Installation Instructions for Your Safety



WARNING



If you do not follow these instructions exactly, a fire or explosion could result causing property damage, personal injury or loss of life.

Installation Codes

- ☐ The installation must conform with local codes or, in the absence of local codes, with National Fuel Gas Code, ANSI Z223.1/NFPA 54.
- ☐ Properly ground the unit in accordance with all local codes or in the absence of local codes, with the National Electrical Codes, ANSI/NFPA 70.

Before Installation

- ☐ This water heater does not have a pilot. It is equipped with an ignition device that automatically lights the burner. Do not try to light the burner by hand.
- ☐ Smell all around the water heater area for evidence of leaking gas. Be sure to smell next to the floor because LP gas is heavier than air and will settle on the floor.
- ☐ Use only your hand to turn the manual gas valve knob. Never use tools. If the knob will not turn by hand, don't try to repair it. Call a qualified service technician. Force or attempted repair could result in a fire or explosion.
- ☐ Do not use this water heater if any part has been under water. Immediately call a qualified service technician to inspect the water heater and to replace any damaged parts.



WARNING



WHAT TO DO IF YOU SMELL GAS

- ☐ Do not try to light any appliance.
- ☐ Do not touch any electrical switch; do not use any phone in your building.
- ☐ Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- ☐ If you cannot reach your gas supplier, call the fire department.

TO TURN OFF GAS TO WATER HEATER

- ☐ Turn off all electrical power to the water heater if service is to be performed.
- ☐ Turn the manual gas valve located on the outside of the unit clockwise to the off position.

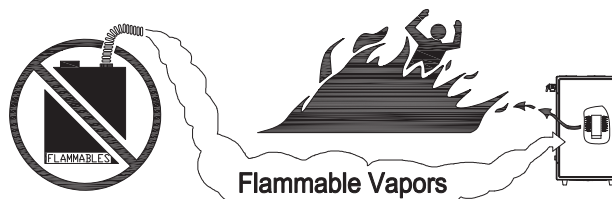
Vapors from flammable liquids will explode and catch fire causing death or severe burns. Do not use or store flammable products such as gasoline, solvents or adhesives in the same room or area near the water heater.

Keep flammable products

- ☐ Far away from water heater
- ☐ In approved containers
- ☐ Tightly closed
- ☐ Out of children's reach

Vapors

- ☐ Cannot be seen
- ☐ Vapors are heavier than air
- ☐ Go a long way on the floor
- ☐ Can be carried from other rooms to the main burner by air currents



WARNING



Use this water heater at your own risk. The set outlet water temperature can cause severe burns instantly or death from scalds. Test the water before bathing or showering. Do not leave children or the infirm without supervision.

Installation Preparation

Unpacking Your Eternal Water Heater

- ☐ Unpack the unit carefully and make sure that all accessories are put aside so that they will not be lost.
 - Operator's manual • Warranty Registration Card • Included Parts
- ☐ Inspect the water heater for possible shipping damages.

Additional Safety Instructions

- ☐ Check the markings of the rating plate on the water heater to be certain the type of gas being furnished corresponds to what the water heater is equipped for.
- ☐ Do not connect this water heater to a fuel type not in accordance with the rating plate.
 - Read the Safety guidelines in the beginning of this manual.
 - The internal computer controlled regulator is preset by the manufacturer and should not be adjusted by user.
 - Maintain proper space around the unit for servicing. Install the unit so that it can be connected or removed easily.
 - The electrical connection requires a means for switching off the power supply.
 - Avoid installing the unit in an area with high levels of dust, sand, or debris. These particles may clog the air vent or impair the function of the fan, leading to improper combustion. Regular maintenance is needed.
 - Do not install the unit where the exhaust vent is pointing into any opening in a building or where the noise may disturb neighbors.

WATER HEATER PLACEMENT

- ☐ Carefully choose the location for the new heater as placement is a very important consideration for the safety of the occupants in the building and for the most economical use of the appliance.
- ☐ Whether replacing an old water heater or putting the water heater in a new location, consider the following critical points:
 - The location selected should be as close to the vent termination point as possible, and centered within the water piping system for best hot water delivery. All water heaters can leak. Do not install without adequate drainage provisions where water flow can cause property damage.
 - If vented through an outside wall or through the roof using 76.2mm(3") vent piping the total vent run cannot exceed 29m(95feet) with one 90° elbow. If more elbows are required the venting distance must be reduced 1.5m(5feet) for every 90° elbow.
 - Vent piping should slope downward towards the unit. Horizontal runs require adequate support at 1m(3½feet) intervals and vertical runs supported at 1.5m(5feet) intervals.
 - Condensation may be created at times as the combustion gases exit the vent cap. Discoloration of surfaces in proximity to the vent cap may occur.



CAUTION



Before Commencing The Installation

Check that it is in accordance with relevant building and mechanical codes, as well as any local or state or federal regulations.



WARNING



- ☐ The appliance should be located in an area where leakage of the tank or connections will not result in damage to the area adjacent to the appliance or to lower floors of the structure. When such locations cannot be avoided, it is recommended that a suitable drain pan be installed under the appliance. The pan must not restrict combustion air flow.
- ☐ The minimum inlet gas pressure must be within the value specified by the manufacturer and the minimum value listed is only for the purpose of input adjustment.
- ☐ If a water heater is installed in closed water supply system, such as one having a backflow preventer in the cold water supply line and a thermal expansion tank is required, contact the water supplier or local plumbing inspector on how to control this situation.
- ☐ The Temperature and Pressure (T&P) relief valve must be certified as meeting the requirement of the Standard for Relief Valves and Automatic Gas Shut-off Devices for Hot Water Supply Systems ANSI Z21.22/CAN1-4.4. The valve must be marked with a maximum set pressure not to exceed the marked hydrostatic working pressure of the water heater 10342.5mbar (150psi) and a discharge capacity not less than the water heater input rate as marked on the rating plate.

Condensate Disposal



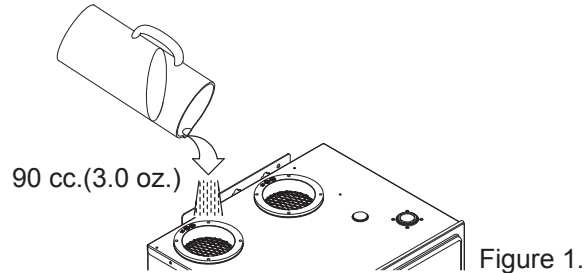
CAUTION



The condensate drain must be filled and unobstructed to allow flow of condensate. The condensate should not be subjected to conditions where freezing could occur. If the condensate is subjected to freezing or obstructed, it can leak, resulting in potential water damage to the unit and surrounding area.

The condensate trap must be filled with water prior to using the water heater.

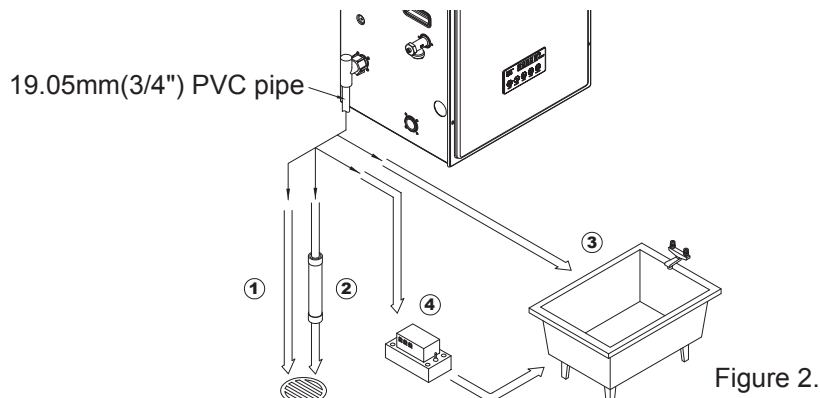
- Fill 90 cc.(3.0 oz.) water through exhaust collar per figure 1.



NOTICE



The drain line material must be an approved material by the authority having jurisdiction. In absence of such authority, PVC and CPVC piping must comply with ASTM D1785 or D2845. This pipe must be connected to the port at the side panel. The end of the pipe should drain to laundry tub or to a floor drain.



NOTICE



Eternal water heater will typically produce a condensate that is considered slightly acidic with a Ph content approximately 3-4. Install a neutralizing filter if required by authority having jurisdiction (See figure 2).

1. Direct to drain from the unit.
2. Drain through neutralizer from the unit.
3. Drain to laundry tub from the unit, in this case the unit must be above the height of laundry tub.
4. When installing a condensate pump, ensure the pump is approved for use with condensing appliance.

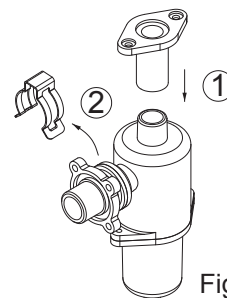
The pump should be equipped with an overflow switch to prevent property damage from potential condensate spillage.

CLEAN OUT OF TRAP

Over time, blockage of the trap by debris may occur; when the condensate cannot be released, the unit will go into error and will shut down. When this occurs, the trap must be cleaned.

To Remove Trap

1. Gently pull trap body downwards to remove.
2. Remove clip securing trap to the nipple.



Indoor Installation

Clearances

From top of water heater	30cm (12")	From back of unit	1.5cm (0.6")
From front of unit	60cm (6")	From left side of unit (gas piping side)	15cm (6")
From side wall flue or vent connector in any direction	15cm (6")	From right side of unit	5cm (2")

Combustion Air Supply

- ☐ GU145(S) / GU195(S,M) can be used as either Power-Vent or Direct-Vent appliance. When used as a Power-Vent appliance, the water heater should be located in an area where enough air is available for proper combustion and ventilation. Follow the latest edition of ANSI Z223.1 and any of your local codes that are applicable.
- ☐ GU145(S) / GU195(S,M) is a Category IV vented appliance and manufacturer's ventilation specifications should be followed.
- ☐ In general these requirements specify that if the unit is installed in a confined space, there must be permanent air supply openings if Eternal isn't installed as Direct-Vent.



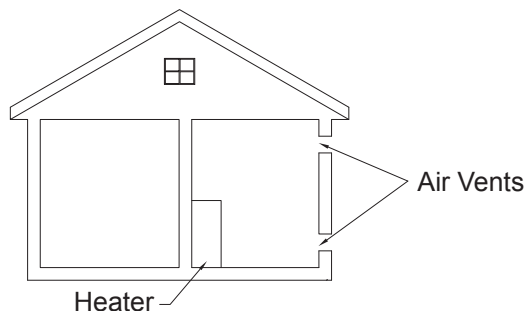
WARNING



Improper installation can cause nausea or asphyxiation from carbon monoxide and flue gases which could result in sever injury or death. For installation in altitudes above 1,350m(4,500feet), contact the manufacturer for installation instructions.

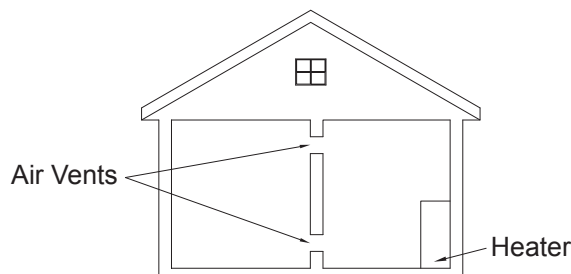
Air supply from outside building:

When combustion air is supplied directly through an outside wall such as intake louvers openings into the dwelling, each opening should give a minimum free area of one square cm per 4.4 kW(15,000 Btu/hr) of the total input ratings of all appliances in the enclosed area.



Air supply from inside building:

When combustion air is supplied from inside the building, each opening should give a minimum free area of one square cm per 1.1 kW(3,750 Btu/hr) of the total input ratings of all appliances in the enclosed area. These openings should never be less than 258 cm²(40 sq.in.).



The minimum required inside air volume should be 1.42 m³(50 cu.ft) per every 1.1 kW(3,750 Btu/hr).

Model #	Water Heater Capacity	Minimum Required Air Volume
GU195 (S,M)	Max. 58.3 kW (199,000 Btu/hr)	75 m ³ (2649 cu.ft)
GU145 (S)	Max. 42 kW (145,000 Btu/hr)	54.7 m ³ (1932 cu.ft)

Mobile Home Installation



WARNING



Read and Review this entire Manual with special emphasis on the combustion and ventilation for your safety. If you do not follow these instructions exactly, a fire or explosion could result causing property damage, personal injury or loss of life.

Eternal water heater must be used as sealed combustion type (Direct Vent) where all the combustion air is supplied from the outdoors through the air intake and all combusted gas by products are vented directly to the outside by means of the vent termination.

MOBILE HOME(Manufactured Home).

This appliance must be installed in accordance with the Manufactured Home Construction And Safety Standard,(Title 24, CFR; Part 3280). In addition, install in accordance with the following instructions, the instructions supplied with the venting termination, local codes, utility company requirements for the installation of water heaters in manufactured homes (mobile homes). In the absence of such a standard, the water heater should be installed in accordance with the latest edition of the National Fuel Gas Code, ANSI Z223.1/NFPA 54 and ANSI A119.5/NFPA 501D.

LOCATION for MOBILE HOME(Manufactured Home).

This water heater must be installed within an enclosure so as to separate the water heater's combustion and venting system from the interior atmosphere of the manufactured home and trailer. All air for combustion must be obtained from the outside atmosphere. And the by products of combusted gases (flue gases) must be discharged directly to the outside atmosphere through the gas vent. There must not be any door or other opening into the water heater enclosure from the inside of the manufactured home. Please refer to installation diagrams (Page 21).

Placement of Water Heater: Locate the water heater as desired, make certain the minimum clearances are maintained. For indoor and outdoor installation follow entire Eternal operation manual, please see section of manufactured home and recreational park trailer outdoor installation.

When installing in a garage, the heater's ignition source should be elevated no less the 457mm (18") from the floor unless the flooring is listed as being resistant to the ignition of flammable vapors.

Operations Manual should be attached to the unit after installation.

Wall Mounting



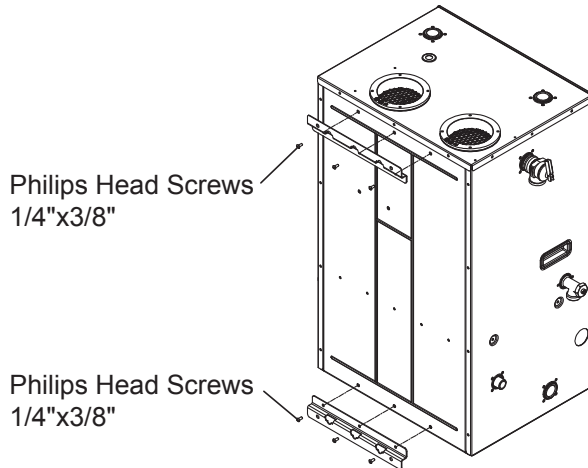
WARNING



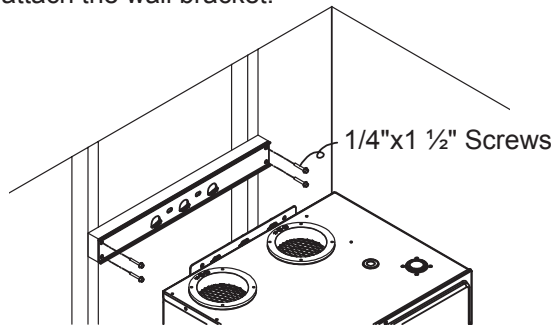
The water heater must be properly supported; if the wall is not strong enough, be sure to reinforce the wall. The unit must be mounted on a vertical wall and level to the ground.

Mounting Steps

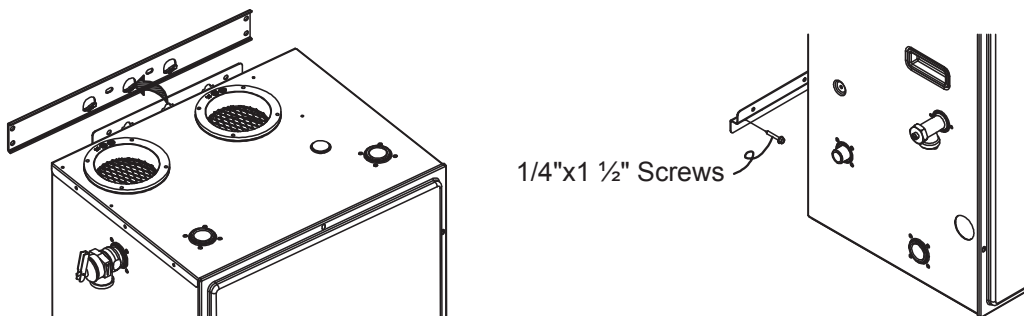
1. Install mounting brackets with 6 screws on top and bottom back of the unit.



2. Select a location on the wall to mount the unit. The included wall bracket has been pre-drilled for easy installation on standard stud walls. If the framing is not standard or installing on an uneven surface, fasten 19.05mm(3/4") plywood to the stud wall and then attach the wall bracket.



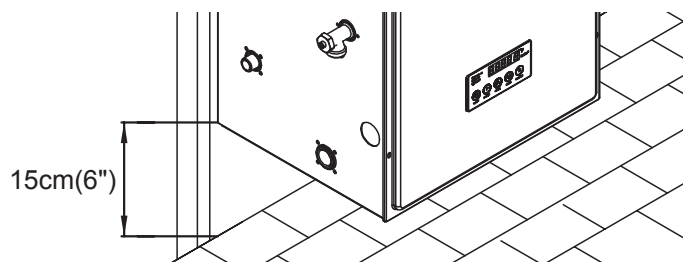
3. Hang the unit on the mounted wall bracket and secure bottom of the unit to the wall with included wall anchors and wall screws.



Wall Mounting For Commercial Food Service

Per ANSI / NSF-5, the unit must be mounted at least 15cm(6") above the floor from the base of the unit.

This mounting clearance provides access for clearing any possible debris or accumulated water seepage that can occur below the unit.



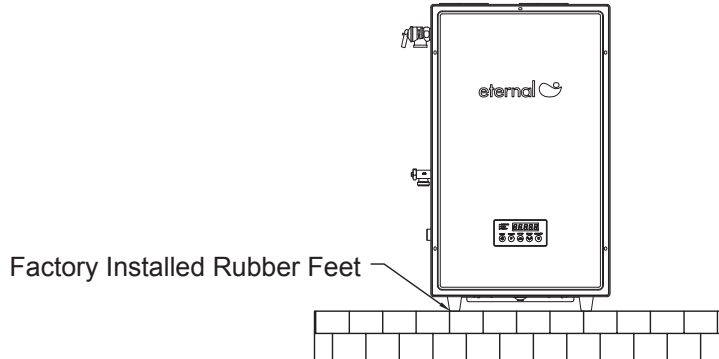
Floor Mounting

Standing Installation

- GU145(S) / GU195(S,M) can be installed standing on combustible floor surface, or on a water heater stand.
- Be sure to use a suitable draining pan under the unit if leakage of the tank or connections will result in damage to the area adjacent to the appliance.

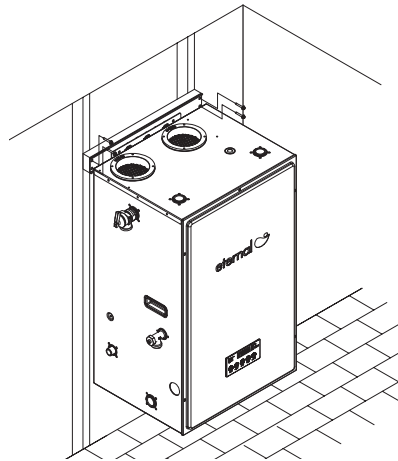
Floor Standing

Place unit directly on an even surface. Factory installed rubber feet can be adjusted if the surface is slightly uneven.



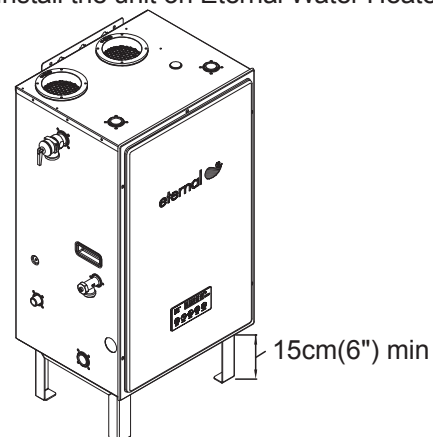
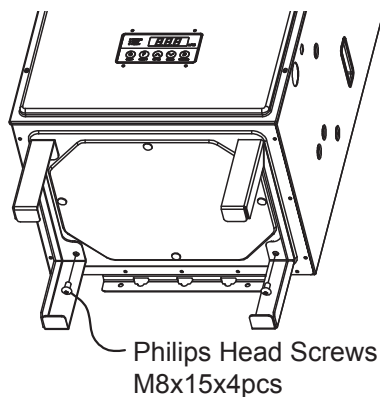
Earthquake Proofing

Secure the unit to the wall with included wall mount bracket. Be sure to install the wall mount bracket on studs.



Water Heater Stand For Commercial Food Service

Per ANSI / NSF-5, floor standing directly on the hard surface is NOT an acceptable installation method. The unit must be elevated at least 15cm(6") off the floor. This mounting clearance provides access for clearing any possible debris or accumulated water seepage that can occur below the unit. Install the unit on Eternal Water Heater Stand (P/ N 314080136) that raises the unit at least 15cm(6") above the floor.



CAUTION



If local codes require the water heater to be raised 46cm(18") above floor, installing GU145(S) / GU195(S,M) on the optional Eternal Water Heater Stand (P/N 314080136) will satisfy code. In conjunction, the unit on stand raises the FVIR compliant igniter and burner at least 46cm(18") off the floor. Alternatively, raising the unit at least 15cm(6") off the floor will also satisfy code.

Venting Intake & Exhaust Material



WARNING



This water heater must be properly vented for removal of exhaust gases to the outside atmosphere. Correct installation of the vent pipe system is mandatory for the safe and efficient operation of this water heater and is an important factor in the life of the unit.

Vent Pipe Material

Eternal Hybrid Water Heater is a gas burning appliance with fan-assisted exhaust. The appliance must be vented with 50.8 or 76.2mm(2" or 3") Category IV special venting, which is air tight to prevent leakage of exhaust gases. The appliance must be vented separately from all other appliances. The following type of non-metallic vent can be used:

- PVC (schedule 40, ASTM-D1785)
- PVC-DWV (ANSI/ASTM-D2665)
- PP Pipe Single wall & Components (UL 1738)
- CPVC (schedule 40, ASTM-D2846)
- ABS (schedule 40, ASTM-D2661)

* Note : Do not use cellular foam core pipe.

Cementing PVC, ABS or CPVC PIPE and FITTING

All primers, cleaners and cements must meet all local codes and applicable standards of the American Society for Testing Materials (ASTM).



NOTICE-VENTING GUIDELINES



The following guidelines should be followed when installing the exhaust outlet piping:

- ☐ Venting should be as direct as possible with a minimum number of pipe fittings.
- ☐ Venting diameter must not be reduced unless specially noted in the installation instructions.
- ☐ Support all horizontal pipe runs every 1m(3½ feet) according to local codes.
- ☐ Vents run through unconditioned spaces where below freezing temperatures are expected should be properly insulated to prevent freezing. For horizontal runs, wrap the vent pipe with self-regulating 3 or 5 watt heat tape. The heat tape must be U.L. listed and installed per manufacturer's instructions.
- ☐ Do not connect this venting system with an existing vent or chimney.
- ☐ Do not connect common vent with the vent pipe of any other water heater or appliance.



WARNING



For installations in Canada, field supplied plastic vent piping must comply with CAN/CGA-B149.1(latest edition) and be certified to the Standard For Type BH Gas Venting Systems,ULC S636 Components of this listed system shall not be interchanged with other vent systems or unlisted pipe/fittings. All plastic components and specified primers and glues of the certified vent system must be from a single system manufacturer and not intermixed with other system manufacturer's vent system parts.

The supplied vent connectors are certified as part of the water heater.



WARNING



If the Eternal combustion air inlet is located in an area likely to cause or contain contamination, the combustion air must be repiped and terminated at another location. Contaminated combustion air will damage the unit and its burner system, resulting in possible severe personal injury, death or substantial property damage.

Direct Venting

Direct Vent

- ☐ GU145(S) / GU195(S,M) is factory configured as sealed combustion unit with dedicated intake and exhaust connections.
- ☐ When installed as a Direct Vent appliance, all combustion air is drawn directly from outside.
- ☐ Direct Vent configuration is suitable for indoor only.
- ☐ Recommended for facilities with difficulty accessing combustion air.

Maximum Allowable Vent and Combustion Air Piping Length

Minimum Required Air Volume			
50.8mm (2") Piping		76.2mm (3") Piping	
M (feet)	Max # of 90° elbows	M (feet)	Max # of 90° elbows
10 (35)	3	30 (100)	6

- Reduce the maximum allowable length for each elbow used as follows:
 - 45 degree elbow : Deduct 0.75m(2½ feet)
 - 90 degree elbow : Deduct 1.5m(5 feet)
- The intake vent length can be of equal length or less; there is no balancing requirement between intake and exhaust.



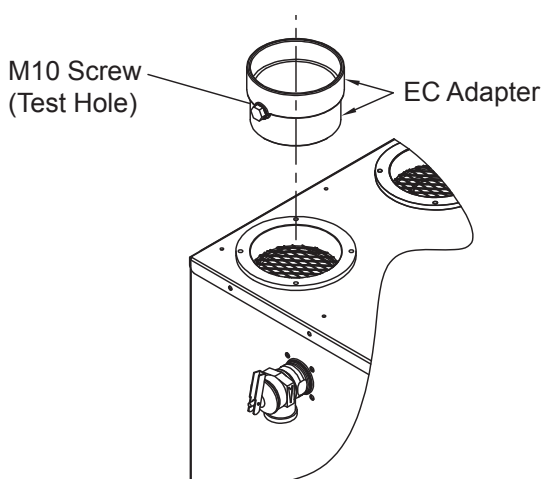
WARNING



For installation in altitude over 1,200m(4,000feet), Do Not connect this venting system with 50.8mm(2") piping. If vent run is started with 76.2mm(3") PVC, the remainder of the run should be 76.2mm(3") PVC.

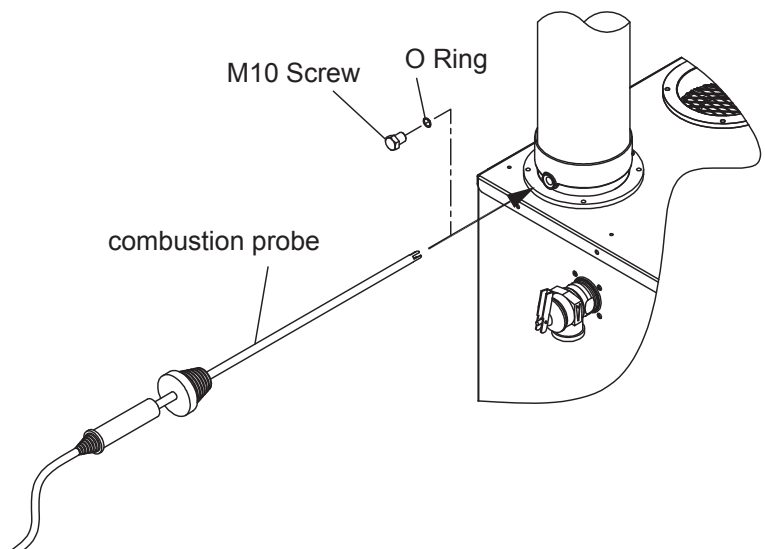
EC Adapter Installation

☐ How to install the EC Adapter



☐ How to test exhaust combustion air

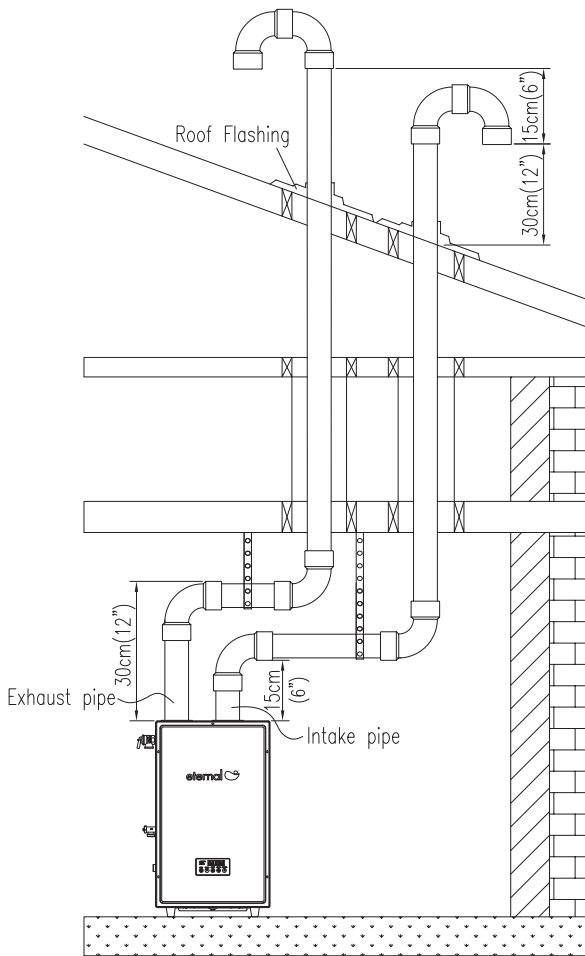
1. Loosen M10 screw.
2. Insert the combustion probe.
3. After test, retighten M10 screw on the EC Adapter and make sure no leak.



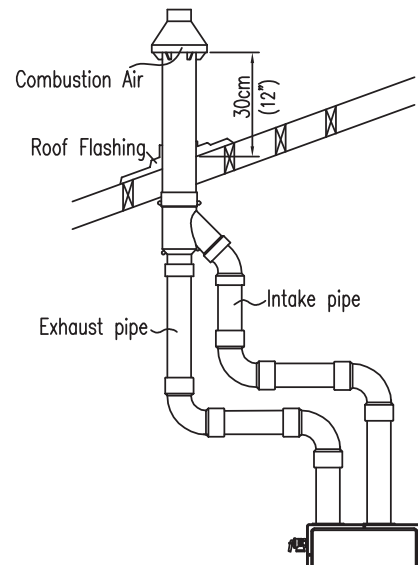
Vertical Termination

Below diagrams are examples of vertical terminations.

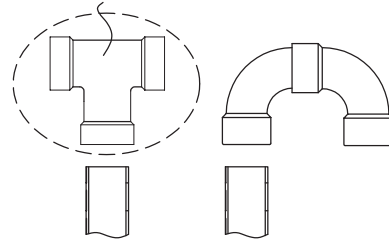
☐ Through roof (Direct Vent)



☐ Through roof (Concentric Vent)



An open tee is optional and can be used as termination to alleviate back pressure in the venting system in areas experiencing abnormally high winds



WARNING

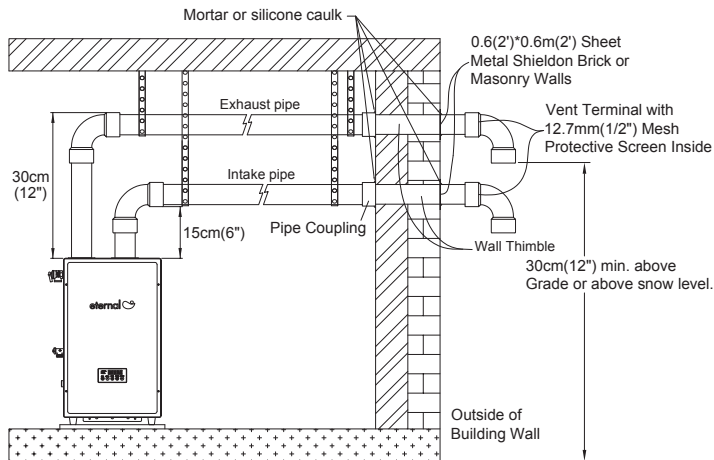


- ☐ Minimum 30cm(12") above anticipated snow level.
- ☐ It cannot be connected to existing vent piping or chimney.
- ☐ The total vertical and horizontal runs cannot exceed the maximum length with a maximum number of 90 degree elbows as specified in the table of page 20.
- ☐ Eternal can be vented straight up and horizontal section is not required for vertical terminations.

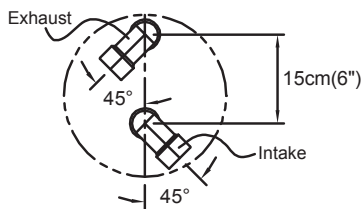
Horizontal Termination

Below diagrams are examples of vertical terminations.

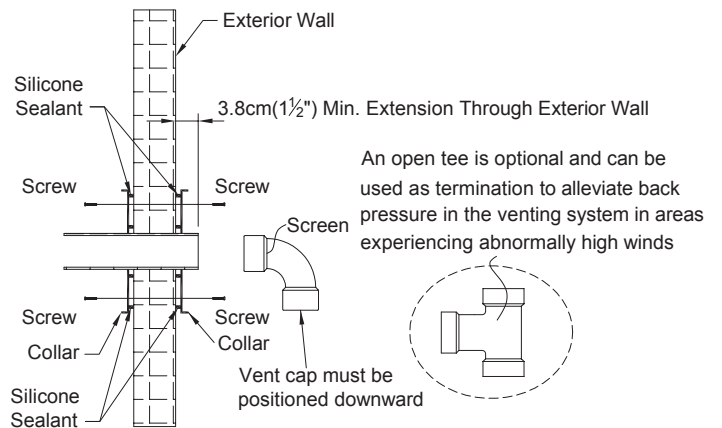
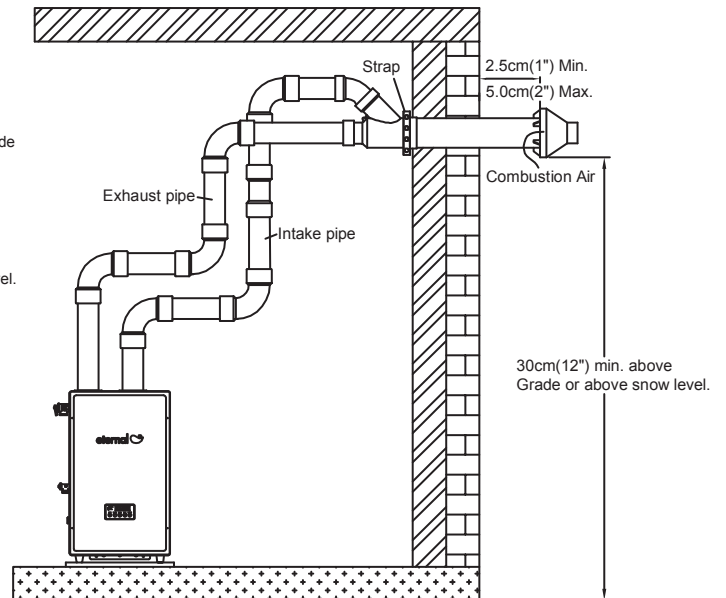
□ Side Wall (Direct Vent)



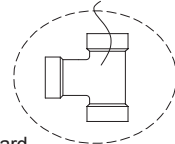
Exterior View



□ Side Wall (Concentric Vent)



An open tee is optional and can be used as termination to alleviate back pressure in the venting system in areas experiencing abnormally high winds



WARNING



- Once the vent terminal location has been determined, make a hole through the exterior wall to accommodate the vent pipe. Vent pipe must exit exterior wall horizontally only.
- Place the 12.7mm (1/2\") metal mesh screen inside the terminal fitting and connect it as shown to the vent pipe on the exterior of the building.
- Seal any opening around the vent pipe or fittings with mortar or silicone caulk as shown above.
- Complete the rest of the vent pipe installation to the water heater's vent connector fitting on the blower outlet. If necessary support horizontal run as previously mentioned.

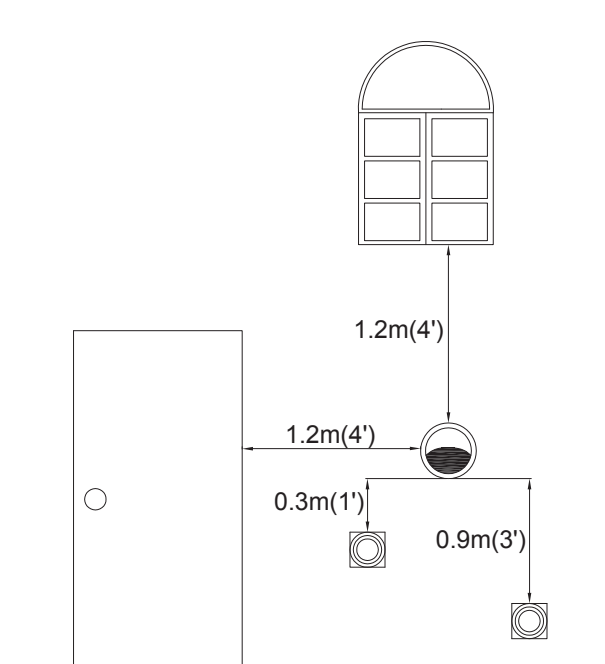
Clearance Requirements from Vent Terminations to Building Openings

All clearance requirements are in accordance with ANSI Z21.10.3 and the National Fuel Gas Code, ANSI Z223.1 and in Canada, in accordance with NSCNGPIC.

□ Vent Clearances When Heater is Installed Indoors

Maintain the following clearances to any opening in any building:

- 1.2m(4') below, 1.2m(4') horizontally from, or 0.3m(1') above any door, operable window, or gravity air inlet into any building.
- 0.9m(3') above any forced air inlet within 3m(10').



WARNING

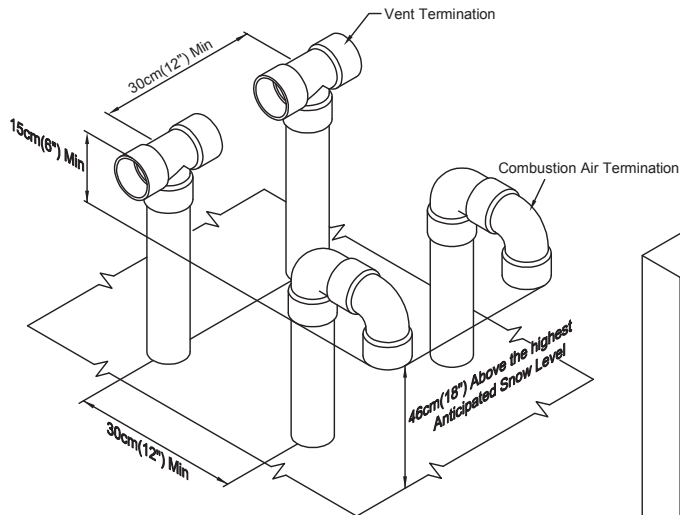


For Installations in Canada, clearances are as follows: To windows, doors, & gravity air inlets: 91cm(36").
To forced air inlets: 15cm(6").

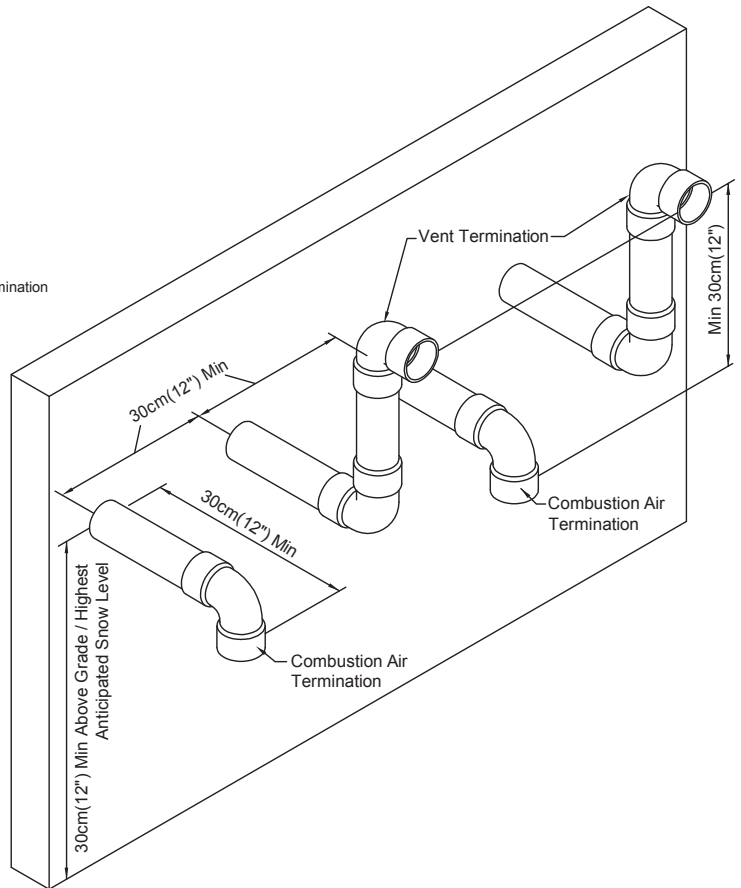
Multiple Units Termination

* Multiple unit Termination

☐ Vertical Terminations



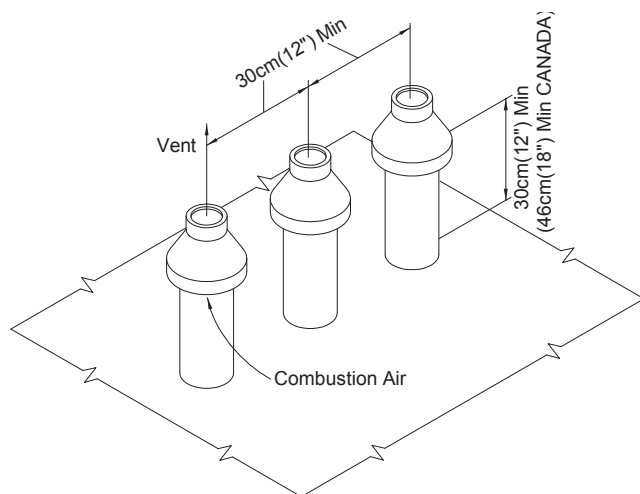
☐ Horizontal Terminations



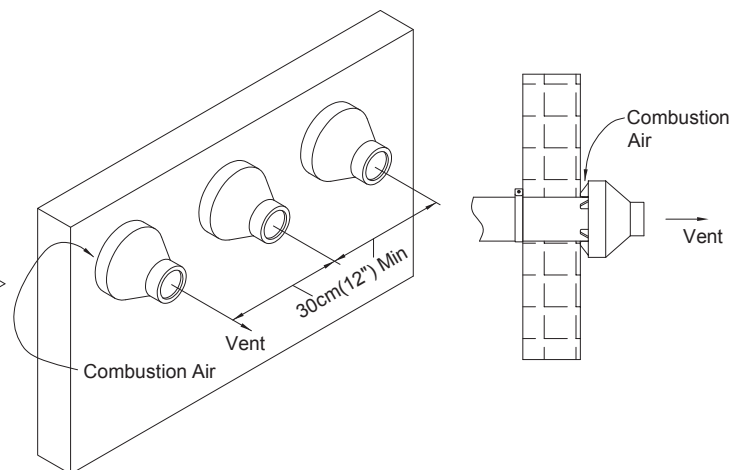
* Concentric Multivent Termination

When two or more direct vent units are vented near each other, each unit must be individually vented, but next unit vent termination must be at least 30cm (12") away from the first unit. It is important that vent termination to avoid recirculation of flue gases.

☐ Vertical Terminations



☐ Horizontal Terminations



Concentric Vent Kit

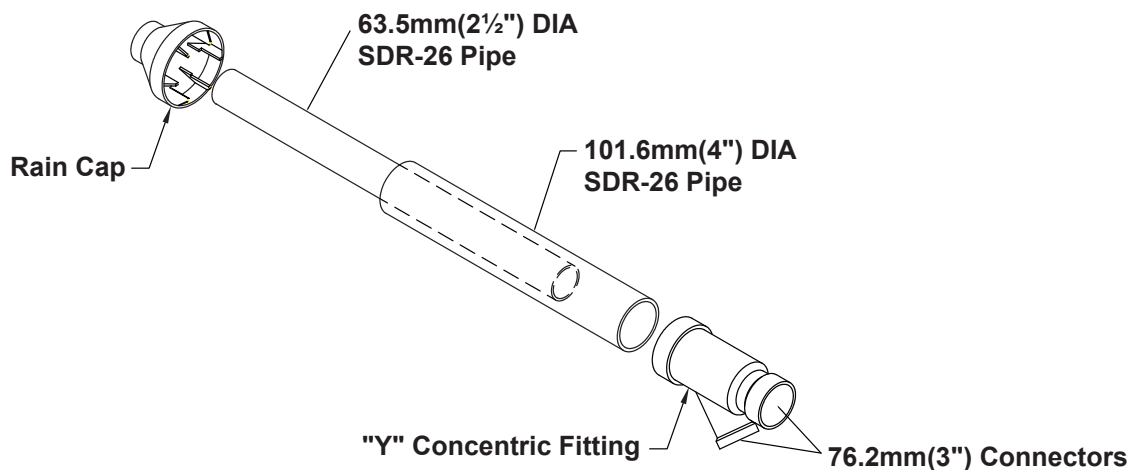


WARNING



- ☐ Do not operate the appliance with the rain cap removed or recirculation of combustion byproducts may occur. Water may also collect inside the larger combustion air pipe and flow to the burner enclosure. Failure to follow this warning could result in product damage or improper operation, personal injury, or death.
- ☐ Do not allow insulation or other materials to accumulate inside the pipe assembly when installing through the hole. Ensure termination height is above the roof surface or anticipated snow level (46cm(18") in Canada).
- ☐ Do not field-supplied couplings to extend pipes. Airflow restriction will occur and may cause intermittent operation.
- ☐ Do not use concentric kits which are not approved by Grand Hall, as this may void the warranty.

* Approved Grand Hall Concentric Kit



NOTICE



When using the approved concentric kit, the total maximum vent run can only be 50'. If using elbows please use: max 5 90° elbows subtract 5' per elbow or max 8 45° subtract 2.5' for elbow.



NOTICE



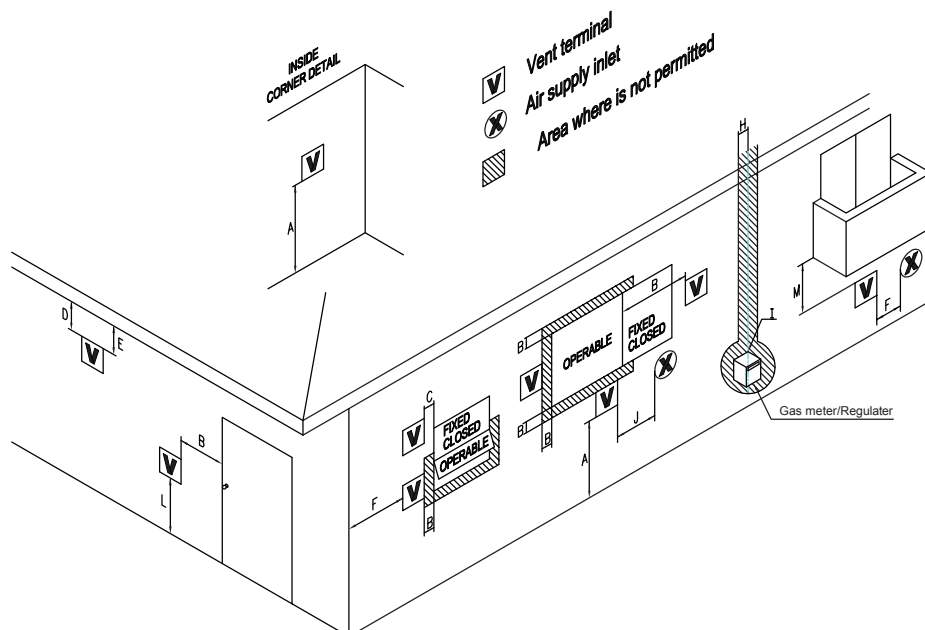
Requirements for Installation in Canada

- ☐ Installations must be made with a vent pipe system certified to ULC-S636.
- ☐ The first three (3) feet of plastic vent pipe from the appliance flue outlet must be readily accessible for visual inspection.
- ☐ The components of the certified vent system must not be interchanged with other vent systems or unlisted pipe/fittings. The inner vent tube must be replaced with field supplied certified vent material to comply with this requirement.

Vent Pipe Installation & Terminator Position

	Description	Canadian Installations
A	Clearance above grade, veranda, porch, deck, or balcony	0.3m (1foot)
B	Clearance to window or door that may be opened	0.9m (3feet)
C	Clearance to permanently closed window	*
D	Vertical clearance to ventilated soffit located above the terminal within a horizontal distance of 60cm(2feet) from the center line of the terminal	*
E	Clearance to unventilated soffit	*
F	Clearance to outside corner	*
G	Clearance to inside corner	*
H	Clearance to each side of center line extended above meter/regulator assembly	0.9m(3feet) within a height 4.5m(15feet) above the meter/regulator assembly
I	Clearance to service regulator vent outlet	0.9m (3feet)
J	Clearance to non-mechanical air supply inlet to the building or the combustion air inlet to any other appliance	0.9m (3feet)
K	Clearance to a mechanical air supply inlet	1.8m (6feet)
L	Clearance above paved sidewalk or a paved driveway located on public property	2.1m (7feet)
M	Clearance under veranda, porch, deck, or balcony	0.3 m (1foot)

*For clearances not specified in ANSI Z223.1 / NFPA 54 or CAN/CSA-B 149.1, please use clearances in accordance with local installation codes and the requirement of the gas supplier.



Gas Supply Piping



NOTICE



- ☐ This unit needs a manual gas control valve (shut-off valve) that must be connected to the unit before the gas line.
- ☐ Check the gas inlet pressure and the type of gas matching the rating plate located on your water heater. Also check to make sure your gas meter is capable of supplying sufficient BTU load to all appliances. Insufficient gas pressure and volume will cause your water heater to be deficient in performance and may not work properly.
- ☐ When connections are completed, check for gas leaks by applying soapy water to all gas fittings and connections. Presence of soap bubbles foaming is a sign of gas leaks.
- ☐ This appliance and its individual shut-off valve must be isolated from the gas supply piping system by unplugging the unit and turning off the main gas valve during any pressure testing of the gas supply piping system at test pressures equal to or less than 34.5mbar (0.5psi).

Gas Piping System Codes

Size gas piping system correctly following ANSI Z223.1/NFPA 54, or by local code.

- ☐ When measuring the inlet supply pressure, the water heater and all other gas appliances sharing the gas supply line must be firing at maximum capacity.
- ☐ Maximum gas pressure must not exceed listed value.
- ☐ Low gas pressure could be caused by an undersized gas pipe; this will cause the water heater's performance to diminish and it would not be able to reach maximum performance.

Recommended Gas Pipe Size (Diameter, for Natural Gas)	
Distance from gas meter	Pipe size (mm)
0 to 6 m (0 to 20 ft.)	19.05 (3/4")
6 to 18 m (20 to 60 ft.)	25.4 (1")
18 to 30 m (60 to 100 ft.)	31.75 (1-1/4")

NATURAL GAS SUPPLY PIPING

Pipe size	Cubic Feet of Natural Gas												
Length	3m (10')	6m (20')	9m (30')	12m (40')	15m (50')	18m (60')	21m (70')	24m (80')	27m (90')	30m (100')	37.5m (125')	45m (150')	60m (200')
1/2"	174	119	96	82	73	66	61	56	53	50	44	40	34
3/4"	363	249	200	171	152	138	127	118	111	104	93	84	72
1"	684	470	377	323	286	259	239	222	208	197	174	158	135
1 1/4"	1404	965	775	663	588	532	490	456	428	404	358	324	278
1 1/2"	2103	1445	1161	993	880	798	734	683	641	605	536	486	416
2"	4050	2784	2235	1913	1696	1536	1413	1315	1234	1165	1033	936	801

Based on 0.60 specific gravity for natural gas at 0.5 "W.C. pressure drop DOE standard is 1100 BTU per cubic ft. of natural gas

PROPANE GAS SUPPLY PIPING

Pipe size	KBTU of Propane Gas												
Length	3m (10')	6m (20')	9m (30')	12m (40')	15m (50')	18m (60')	21m (70')	24m (80')	27m (90')	30m (100')	37.5m (125')	45m (150')	60m (200')
1/2"	276	190	153	130	115	104	97	90	84	79	70	64	56
3/4"	568	394	316	268	238	218	197	186	174	163	147	133	112
1"	1072	733	591	505	449	410	379	347	323	308	276	253	213
1 1/4"	2206	1497	1213	1040	914	835	772	725	678	631	567	511	440
1 1/2"	3308	2300	1859	1560	1418	1276	1182	1087	1024	977	867	788	676
2"	6222	4332	3466	2993	2647	2395	2206	2048	1922	1812	1607	1496	1260

Based on 11 "W.C. supply pressure

LP Conversion



NOTICE



Contact the local propane gas supplier for recommended sizing of piping, tanks and 100% lockup gas regulator.
□ Adjust the propane supply regulator provided by the gas supplier for 3.3Kpa(13"w.c.) maximum pressure.



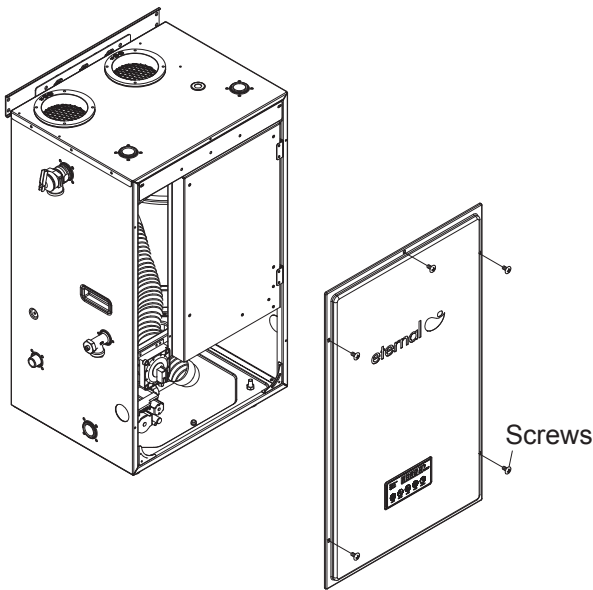
NOTICE



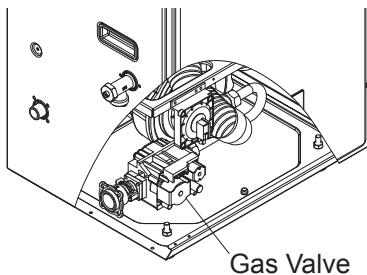
LP conversion kit must be ordered from Grand Hall USA. Conversion can only be completed by a qualified professional.

How to convert to LP

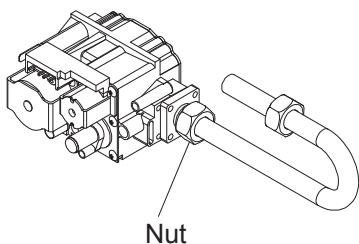
1. Remove front panel by loosening 5 screws.



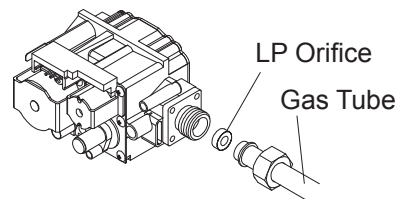
2. Locate the gas valve towards lower left of the unit.



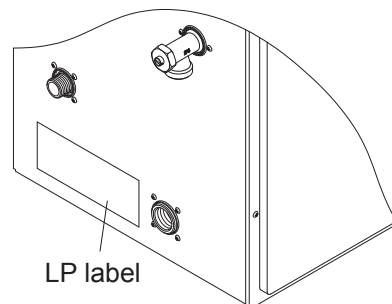
3. Loosen nut connecting gas tube to gas valve.



4. Insert LP orifice into the nozzle, retighten gas tube and make sure no gas leak.



5. Reassemble the front panel and apply the LP label which is in the accessory kit.



WARNING



Prior to start up, ensure the unit is set to fire propane. Check the rating label for the type of fuel. If there is a conflict or doubt on the setup, remove the gas valve and check for the propane orifice. Failure to ensure proper setup could result in severe personal injury, death or substantial property damage.

Water Supply Connection

WATER SUPPLY CONNECT

- ☐ The water fittings on the Eternal water heater are 19.05mm(3/4") NPT.
- ☐ Although Eternal's water connections are 19.05mm(3/4"), if the installation site has only 12.7mm(1/2") plumbing throughout the building, it is not necessary to up size the water lines to 19.05mm(3/4") when installing a single unit.
- ☐ When installing multiple units to supply higher volumes of hot water either in residential applications or in commercial applications, the number of Eternal water heaters required and the header pipe sizing needs to be properly sized to meet the total hot water demand.
- ☐ All pipes, pipe fittings, valves and other components including solder, must be approved for use in potable water systems.
- ☐ The use of unions and material shut off valves on both the cold water inlet and hot water outlet is recommended.
- ☐ The use of galvanized dielectric unions is not recommended for use with an Eternal water heater.



WARNING



Be careful not to reverse the hot water outlet and cold water supply line connections to the water heater. This will cause your heater to operate dangerously and void warranty. Make sure the hot and cold lines are connected properly.



WARNING



Recirculation is strongly recommended for commercial applications with rapid on/off hot water usage or significant dump loads.

FILLING THE WATER

- ☐ Close the water heater drain valve by turning the knob to the right. The drain valve is on the lower leftside of the water heater.
- ☐ Open the cold water supply valve to the water heater.
- ☐ To ensure complete filling of the tank, allow air to purge by opening the nearest hot water faucet. Allow water to run until a constant flow is obtained.
- ☐ Check all new water piping for leaks. Repair as needed.



CAUTION



- ☐ Never use this water heater unless it is completely filled with water.
- ☐ Be certain there are no loose particles or dirt in the piping. Keep a copper pipe diameter at NPT 19.05mm(3/4") diameter to allow full flow. If the hot and cold connections are reversed, the heater will not work properly and could damage the unit. Be sure to connect them correctly.
- ☐ If water flow is low, check the filter by removing the draining valve.

DRAINING THE WATER

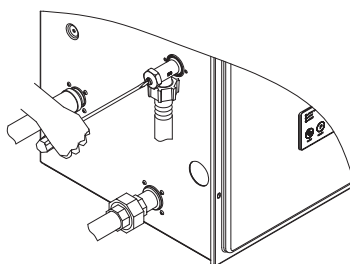
- ☐ Close water supply shut-off valve to the unit first.
- ☐ Connect garden hose to the draining valve located on the lower leftsider of the unit.
- ☐ Open the valve by using a flat head screw driver to drain water with the hose.
- ☐ After draining the tank, turn the valve body to remove the draining valve from the unit and clean the filter.



CAUTION



Do not open the draining valve without connecting a hose so that water can be diverted to an area where water damage is not a problem. Do not remove the draining valve from the unit without first draining the tank.



Condensate Piping

- ☐ This water heater is a high efficiency, fully condensing appliance which produces condensate during operation. The water heater incorporates a collection, neutralization, and removal system which must be properly drained in order to ensure proper operation of this appliance.
- ☐ In order to drain the condensate, a 16mm(1/2") threaded fitting is provided at the left side of the water heater. Do not reduce the size of this fitting or the drain piping to less than 16mm(1/2").
- ☐ Use plastic pipe, such as PVC, for the drain line. Do not use steel, black iron, or any other material which can corrode when placed into contact with condensate water.
- ☐ Keep the length of the drain pipe as short as possible. Long runs or applications where the nearest drain is above the water heater will require the use of a condensate pump. Size the pump to allow for a maximum condensate discharge of 7.6 LPH(2 GPH) from the water heater.
- ☐ Horizontal runs must be sloped 1/4" per 300m(984ft) towards the drain or condensate pump.
- ☐ The end of the drain pipe must not be submerged in water or blocked in any way.
- ☐ Be sure to check that condensate is freely flowing from the drain piping after the system has been installed. Condensate will begin flowing out of the water heater within 15 minutes after operation has started.
- ☐ Take measures to prevent the condensate drain lines from freezing (insulation, heat tape, electric heaters, etc.)



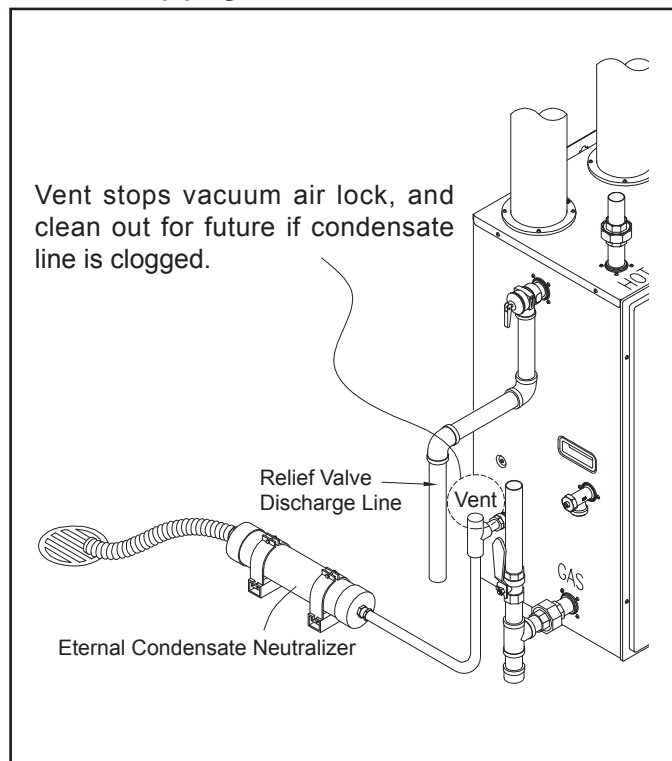
WARNING



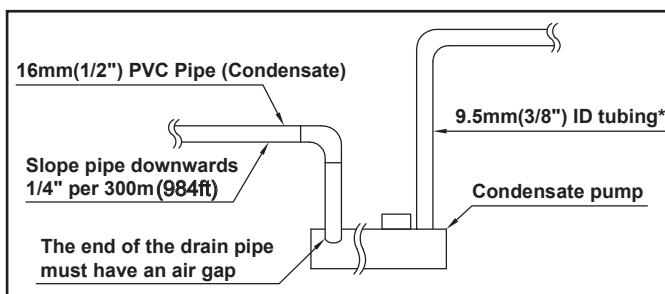
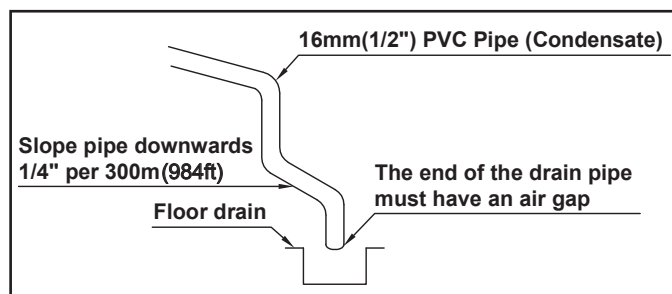
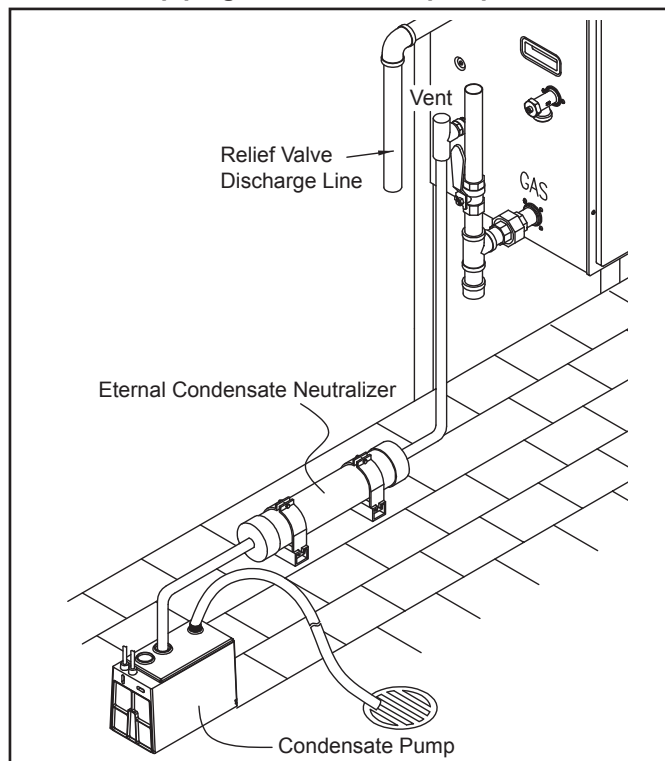
To ensure proper disposal of condensate do not install neutralizer vertically.

TYPICAL INSTALLATION

Condensate piping to floor drain



Condensate piping to Condensate pump



Temperature and Pressure Relief Valve

The following 19.05mm(3/4"), maximum 10342.5mbar(150psi) valves are approved by CSA for use with GU145(S) / GU195(S,M)
: - Cash Acme NCLX-5L



CAUTION



- ☐ The temperature-pressure relief valve should be manually opened once a year.
- ☐ No one should be in front of or around the outlet of the temperature-pressure relief valve discharge line when in use.
- ☐ If after manually opening the valve and it fails to completely reset and continues to release water, immediately close the cold water inlet to the water heater, follow the draining instructions, and replace the temperature-pressure relief valve with a new one. The discharge capacity must be at least 58.3 kW(199,000 Btu/hr) for GU195(S,M), 42 kW(145,000 Btu/hr) for GU145(S).

Troubleshooting Thermal Expansion

If a water heater is installed in closed water supply system, such as one having a backflow preventer in the cold water supply line and a thermal expansion tank is required, contact the water supplier or local plumbing inspector on how to control this situation.

Recirculation Pump Connection

Applicable Models:

GU145(S) / 508(11,12,21,22)1145(S)

GU195(S) / 508(11,12,21,22)1195(S)

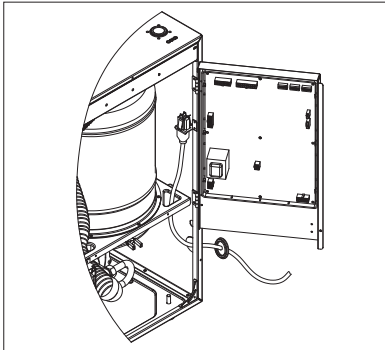
Description:

Eternal has an Internal Pump Control (IPC) that can be optionally enabled to provide enhanced efficiencies. The IPC is easy to use and factory configured as a 3-pronged outlet for recirculation pumps utilizing less than 2A.

Feature and Benefits

- ☐ Eliminates the need to buy a separate pump or aquastat as the pump is controlled by the unit's main controller.
- ☐ Improves gas consumption as the recirculation is no longer run 24/7 unnecessarily.
- ☐ Improved heat exchanger life as the control prevents rapid on/off firing cycles.

Recirculation Pump Connection



- Step 1.
Unplug power cord of unit.
- Step 2.
Make the hole on right side of panel and get rid of burr.
- Step 3.
Insert the pump plug to the hole on right side of panel.
- Step 4.
Insert the pump plug to the pump socket inside of unit.



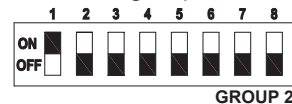
NOTICE



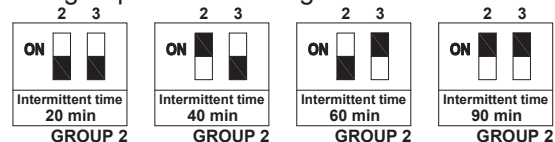
When setting high temperature to 82°C(180°F) for sanitation purpose, we recommend using Aquastat control in the recirculation system instead of using Internal Pump Control because IPC mode can't maintain the temperature to 82°C(180°F) constantly.

How To Activate Internal Pump Control Function

Step 1. Push #1 switch of group 2 like below figure.



Step 2. Set "Pump intermittent time" by selection #2, #3 switch of group 2 like below figure.



- ☐ After each firing cycle, IPC temporarily stops power supply to the pump during intermittent time limited by dipswitch, and starts pump again after set OFF time interval.
- ☐ IPC employs a different ignition logic compared to when Eternal is on recirculation without IPC. Normally, set at 60°C(140°F), Eternal will fire if the inlet thermistor detects return line temperature drop to 54°C(129°F). However, with IPC engaged the logic changes, Eternal will fire if the return line water temperature is 41°C(106°F).



WARNING



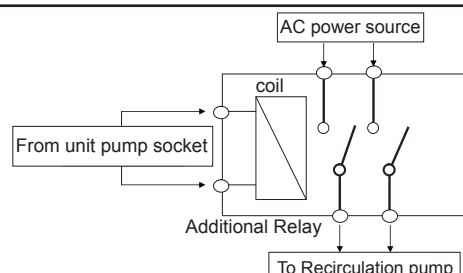
If the inlet thermistor detects incoming water exceeding 65°C, the unit will lock down and not fire up despite sensing demand until it is reset by powering off then on. In such cases, an aquastat should be used to control the pump to make sure that the recirculation loop does not exceed 65°C(149°F). Use a thermostatic mixing valve to limit inlet temperature if heated water will be passing through Eternal's inlet at temperatures exceeding 65°C(149°F).



CAUTION



If pump needs more than 2 amps, put additional relay between pump socket and pump like figure.



Electrical Connection

Installation Codes:

Follow the requirements of the local authority having jurisdiction. In the absence of such requirements, follow the latest edition of the National Electrical Code ANSI/NFPA 70.

Grounding and Surges

- ☐ Do not plug electrical power to the unit until all plumbing and gas piping is complete and the water heater has been filled with water.
- ☐ All units come with a factory installed 3-pronged power (grounded) plug. It is recommended to run a dedicated electrical line to the water heater to prevent electrical interference.
- ☐ The use of surge protector is recommended to protect from power surges.
- ☐ Do not connect 220-240V AC to this unit. It will damage the water heater and this damage is not covered under warranty.
- ☐ Do not disconnect the power supply when the unit is in normal operation.
- ☐ If there is a power failure in cold weather areas, the freeze prevention system in the water heater will not operate and may result in freezing of the unit. In cold weather areas where power failures are common, you must completely drain the unit to prevent damage if the power will be off for any extended period of time. Damage caused by freezing is not covered under warranty.
- ☐ A battery back-up may be used to supply hot water during periods of power outages. We recommend a computer-grade UPS (uninterruptable power supply) with at least 600VA rating for extended coverage.



WARNING



- ☐ The water heater must be electrically grounded.
- ☐ Do not rely on the gas or water piping to ground the metal parts of the water heater, because plastic pipe or dielectric unions may isolate the water heater electrically. Service and maintenance personnel who work on or around the water heater may be standing on wet floors, and could be electrocuted by an un-grounded water heater.

The water heater requires an electrical power supply of 120 VAC/60Hz, and it must be properly grounded to function.

- ☐ A means for switching off the 120 VAC power supply must be provided.
- ☐ Wire the heater exactly as shown in the wiring diagram.
- ☐ Check all new water piping for leaks. Repair as needed.



CAUTION



Label all wires prior to disconnection when servicing controls. Wiring error can cause improper and dangerous operation. Verify proper operation after servicing.

Please refer to the Wiring Diagram. Note: There is a copy located on the inside of the front panel of the appliance.

Wiring Optional Remote Controller(s)

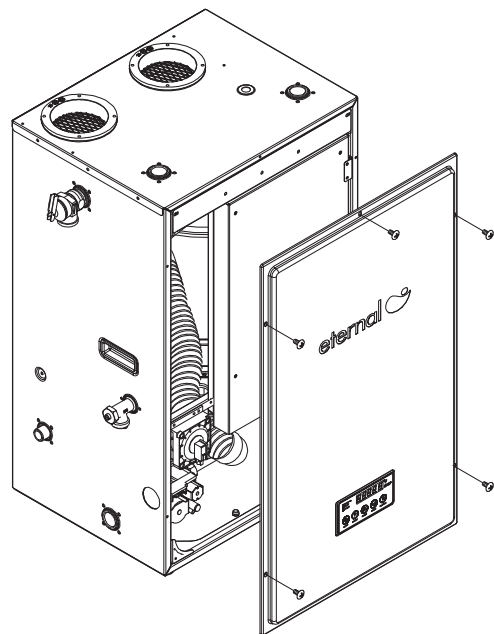
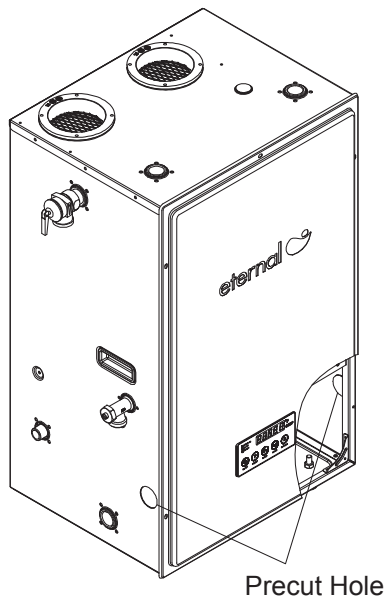
- ☐ Max 30m(100ft) Run.
- ☐ AWG #18 Wire.
- ☐ Parallel or Serial connection are allowed.

Do not make short circuit by contacting the contacts between two wires during installation.

Optional Remote Controller Installation

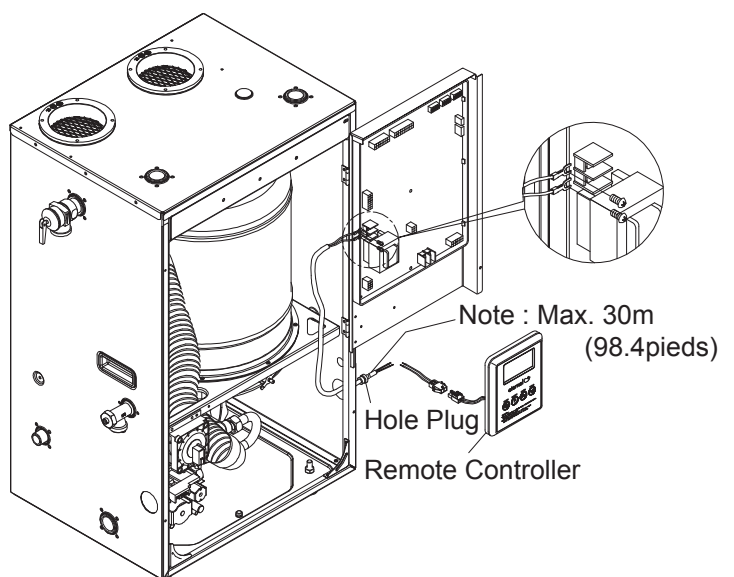
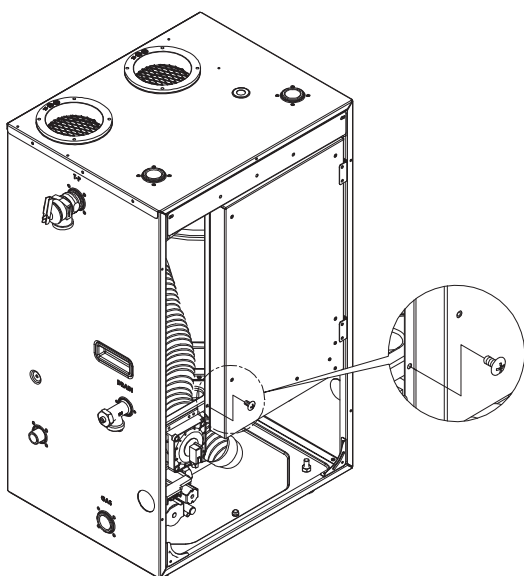
Pre-Installation Preparation

1. Turn off the unit and unplug power cord from wall socket.
2. Remove front panel by loosening 5 screws.
3. Open one of the pre-cut holes on either side panels of the unit and insert the hole plug.



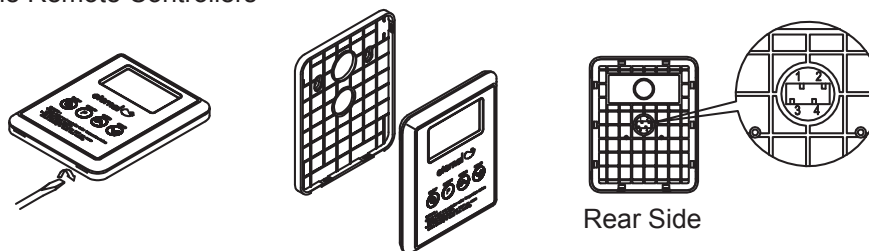
Wiring Instructions

1. Open the main controller PCB cover by removing 1 screw.
2. Run wire from the PCB to where the remote display is to be mounted through the hole plug.
3. Attach wiring to the PCB by loosening 2 screws on the main controller.



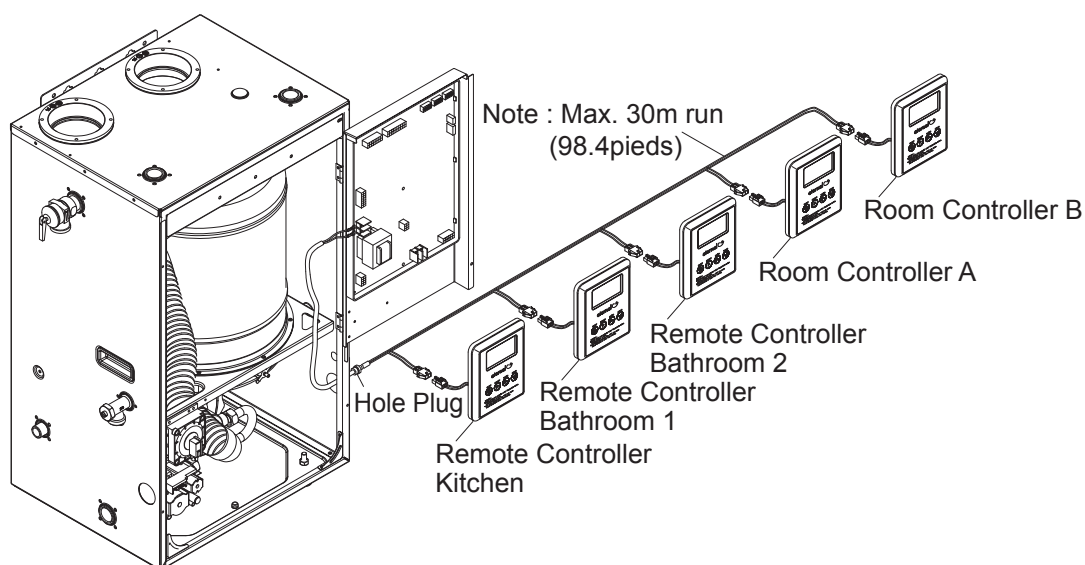
Optional Remote Controller Installation

Configuring Multiple Remote Controllers



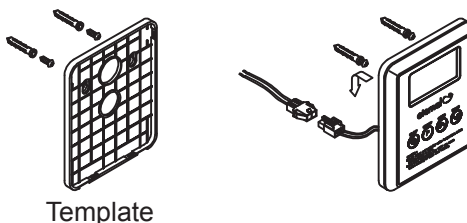
Remote Controller Selection Switch Setting Layout

	Kitchen	1 : Left	2 : Left
		3 : N/A	4 : N/A
	Bathroom 1	1 : Right	2 : Left
		3 : Left	4 : N/A
	Bathroom 2	1 : Right	2 : Left
		3 : Right	4 : N/A
	Room A	1 : N/A	2 : Right
		3 : N/A	4 : Left
	Room B	1 : N/A	2 : Right
		3 : N/A	4 : Right



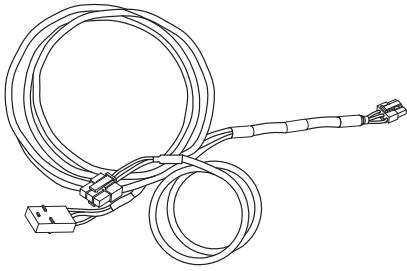
Remote Display Mounting Instructions

1. Decide the appropriate mounting location for the Remote Controller; consider higher positions so that the controller is out of reach for children.
2. Using a flat head screw driver, or a penny, wedge the Remote Controller open to reveal mounting holes under the cover.
3. Using the template, mark two 6.35mm(1/4") holes on the dry wall. Be sure that the holes are level.
4. Drill two 6.35mm(1/4") holes on the dry wall and insert Wall Anchors.
5. Connect wiring to the back of the remote display by loosening 2 screws.
6. Secure the Remote controller to the Wall Anchors using the included Mounting Screw 2 pcs and replace the cover to hide the mounting hardware.



MCU Installation

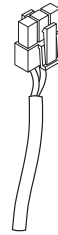
MCU Kit Components



MCU Wire



Female Termination Wire (F1)



Male Termination Wire (M1)

Specifications and Features

Applicable Models :

GU195(M) / 508(11,12,21,22)1195(M)

Description:

MCU kit allows multiple units to be linked together in parallel manifold configuration. By doing so, Etermal can be suitable for large commercial projects. such as motels, apartment complexes and laundromats etc ...

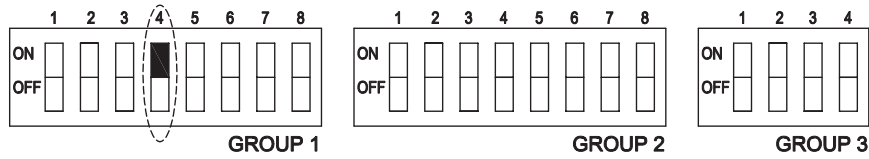
Feature and Benefits

- ☐ High Tech CANBUS Protocol ensures good communication between units.
- ☐ Alternate Host Firing distributes wear and tear across all units every 24 hours.
- ☐ Redundancy program allows remaining units to work when a units breaks down.
- ☐ Synchronized temperature control changes settings on all units from any unit.
- ☐ Up to 8 Eternals can be networked.
- ☐ Automated staged firing allows as little or as much units to fire up as needed.
- ☐ Automated load balancing distributes the work across necessary units evenly.
- ☐ UL1998 Certified.
- ☐ Easy connection.

MCU Installation

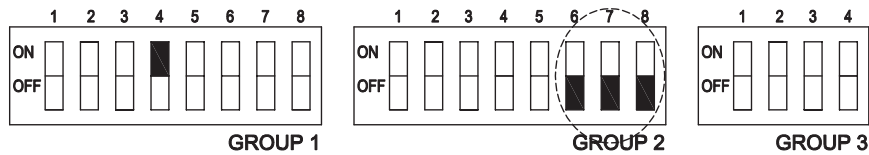
MCU Installation

1. With all taps closed and unit off, unplug the power cord of the unit from the power outlet.
2. Make sure dip switch #4 to ON position. (Group 1, No.4)



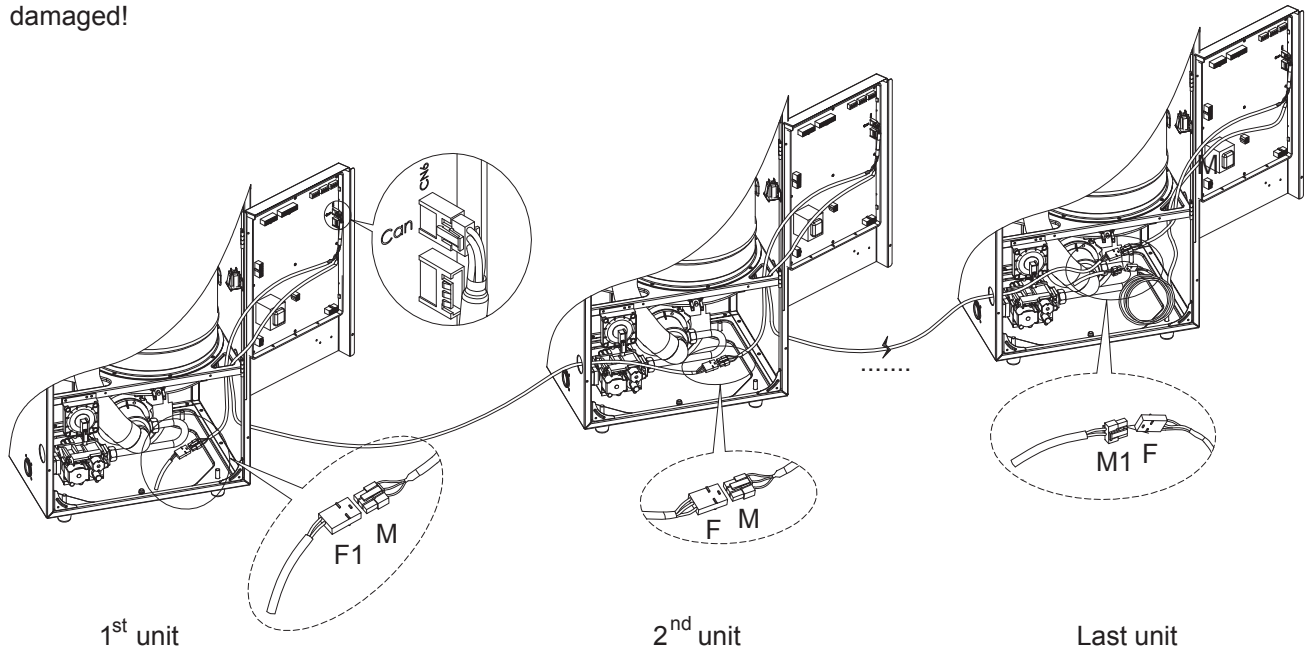
When this switch is on, CAN(Control Area Network) engine is enable and all units will communicate with each other.

3. Make sure dip switch #6, 7, 8 OFF position. (Group 2, No. 6, 7, 8)



If you need more detail information ID setting, refer to page 38 "Unique Unit Identification Number".

4. When multiple units are installed, the MCU wire (Y wire with 3 connectors: 1. CANBUS to main controller 2. short female termination 3. long male termination) must be connected that the short female termination connects to long male termination, so on and so forth. If two long terminations are connected then main controller will be damaged!



5. Connect MCU Wire to CN6 of main controller.
6. Connect Female Termination Wire(F1) to MCU Wire at the first unit.
7. Connect MCU Wire to next MCU Wire.
8. Connect Male Termination Wire(M1) to MCU Wire at the last unit.
9. Plug the power cord of the unit and turn the power ON.



WARNING



When multiple units are installed in MCU configuration, the maximum allowable distance between each unit wiring is 1m(3ft). Excessive wiring length may cause communication interferences.



WARNING



Please note that only up to 4 - GU195Ms can be common vented together.



WARNING



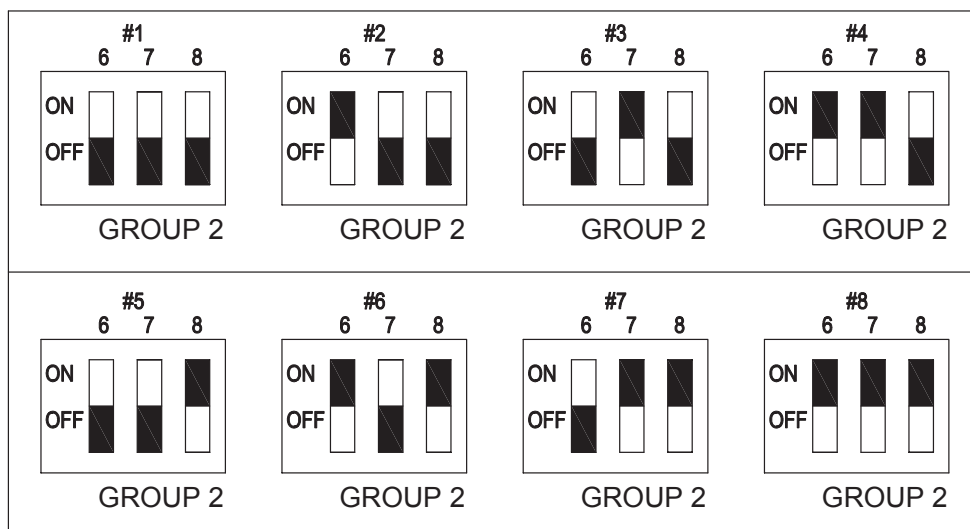
When cascading units into banks, Only use the MCU wiring harness between those units in a bank - do not connect the banks together using the MCU wiring Harness.

MCU Installation

Unique Unit Identification Number

All units networked need to be assigned unique ID numbers. For example, if 3 units are used, the first unit should be assigned #1 by pushing Dipswitch 6,7 and 8 to OFF position. The second unit should be assigned #2 by pushing Dipswitch 6 to ON position while leaving the rest in OFF position. The third unit should be assigned #3 by pushing Dipswitch 7 to ON position while leaving the rest in OFF position.

How many units installed	Identification
2 units	#1, #2
3 units	#1, #2, #3
4 units	#1, #2, #3, #4
5 units	#1, #2, #3, #4, #5
6 units	#1, #2, #3, #4, #5, #6
7 units	#1, #2, #3, #4, #5, #6, #7
8 units	#1, #2, #3, #4, #5, #6, #7, #8



Remote Controller Installation with MCU

Remote Controller must be installed on the unit which is assigned #1 identification by Dipswitch.

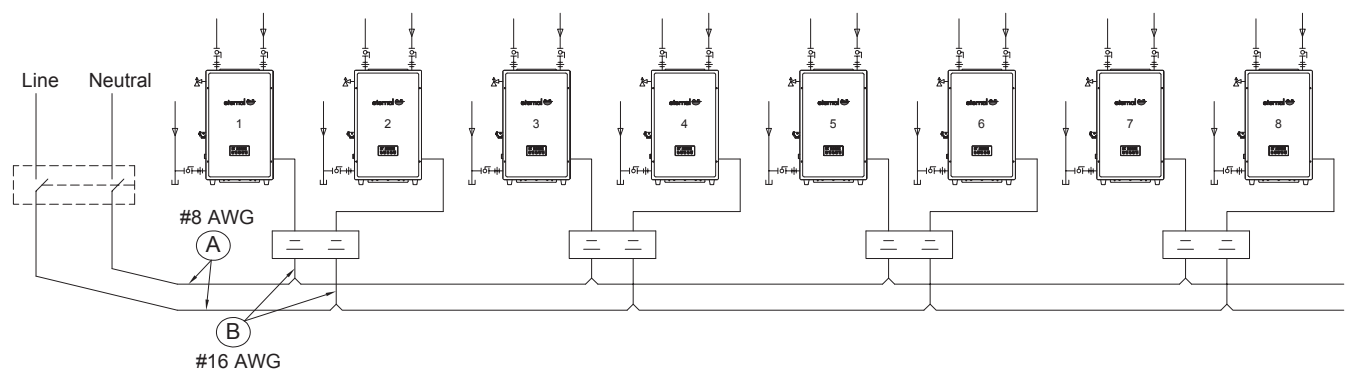
Power Supply Schematic Diagram

Operating as a single unit, Eternal consumes less than 1A current, and the power supplied to unit can be on as low as 2A capacity. However, when multiple Eternals are used together, power supply requirement is significantly increased.

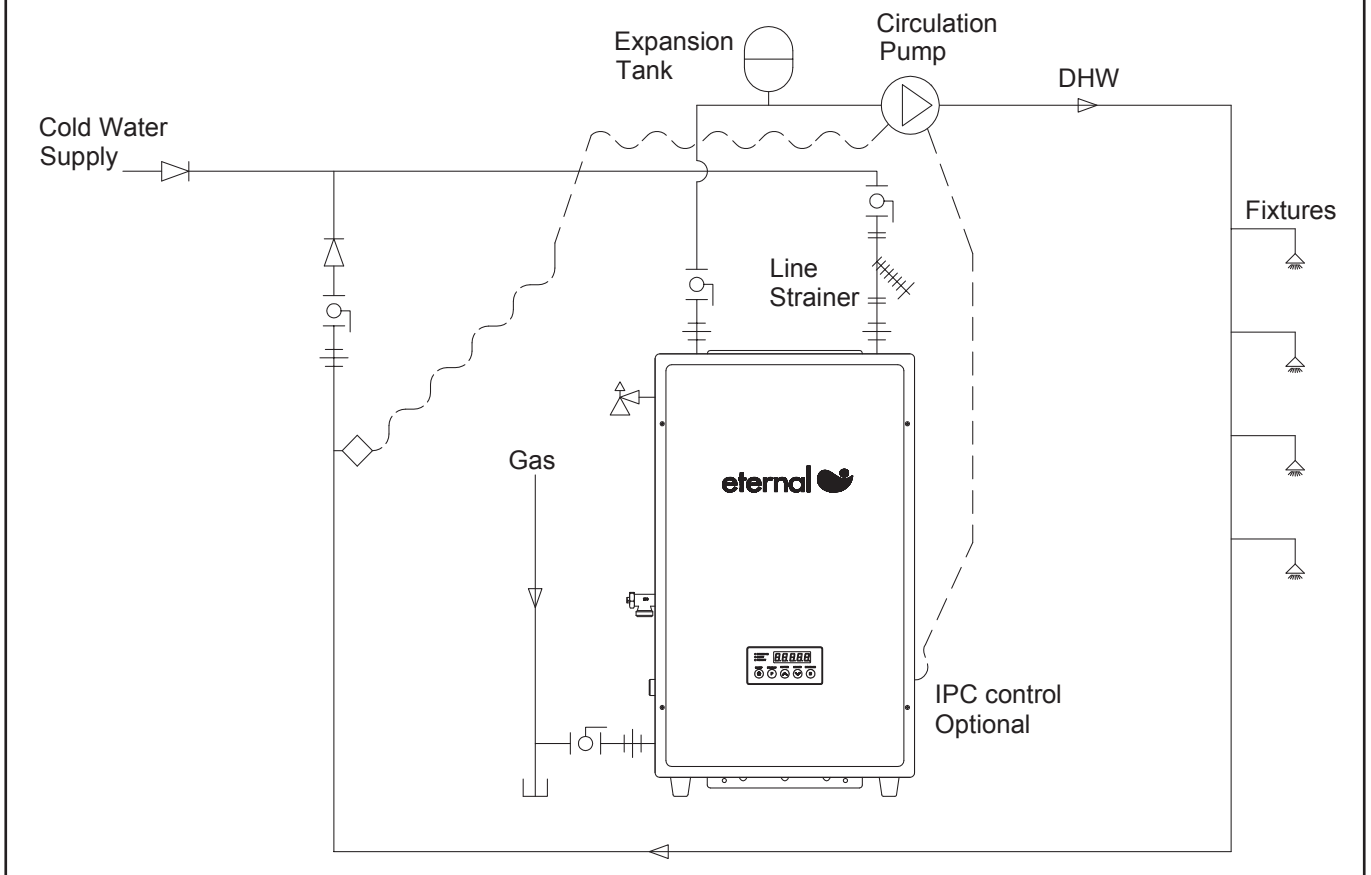
Proper power supply design is important to ensure the safe operation of Eternal. When multiple units are used, the electrical supply needs to increase in capacity. Calculate by the below formula:

$$\# \text{ of units installed} \times 2\text{A per unit} = \text{Total Amperage}$$

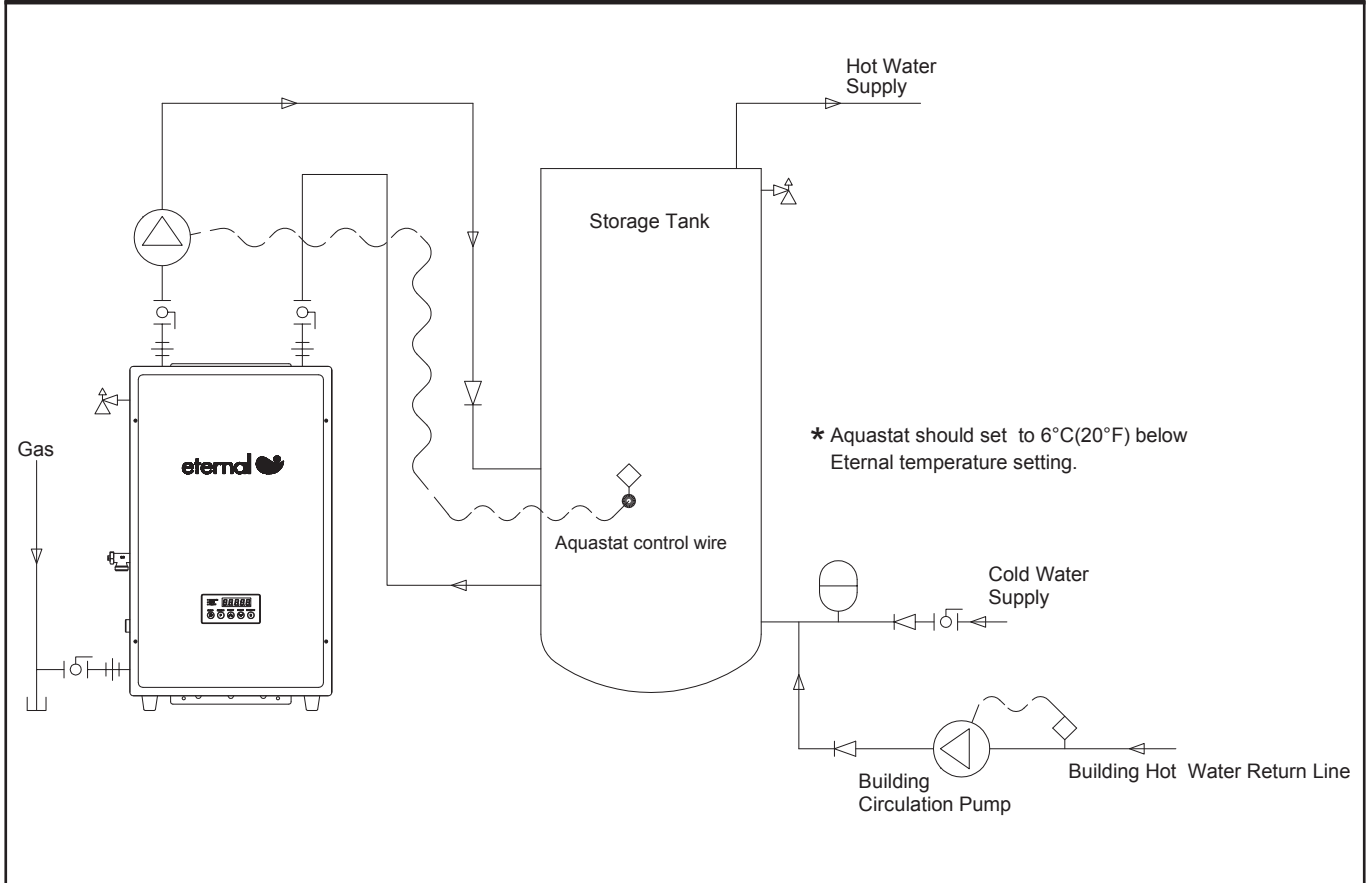
For example, for 8 units, 16A circuit is needed to supply power to the water heaters.



Recirculation System with an Eternal Water Heater

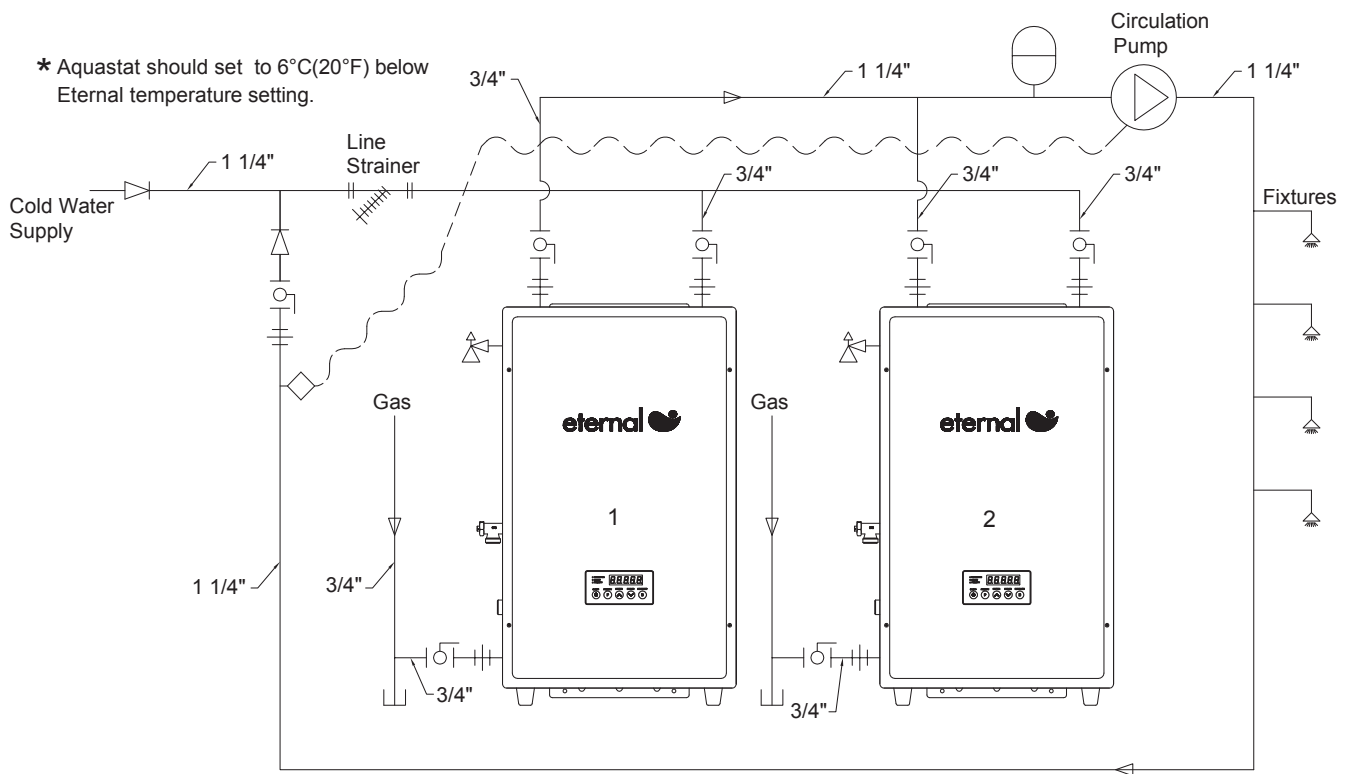


Single Eternal with Storage Back up



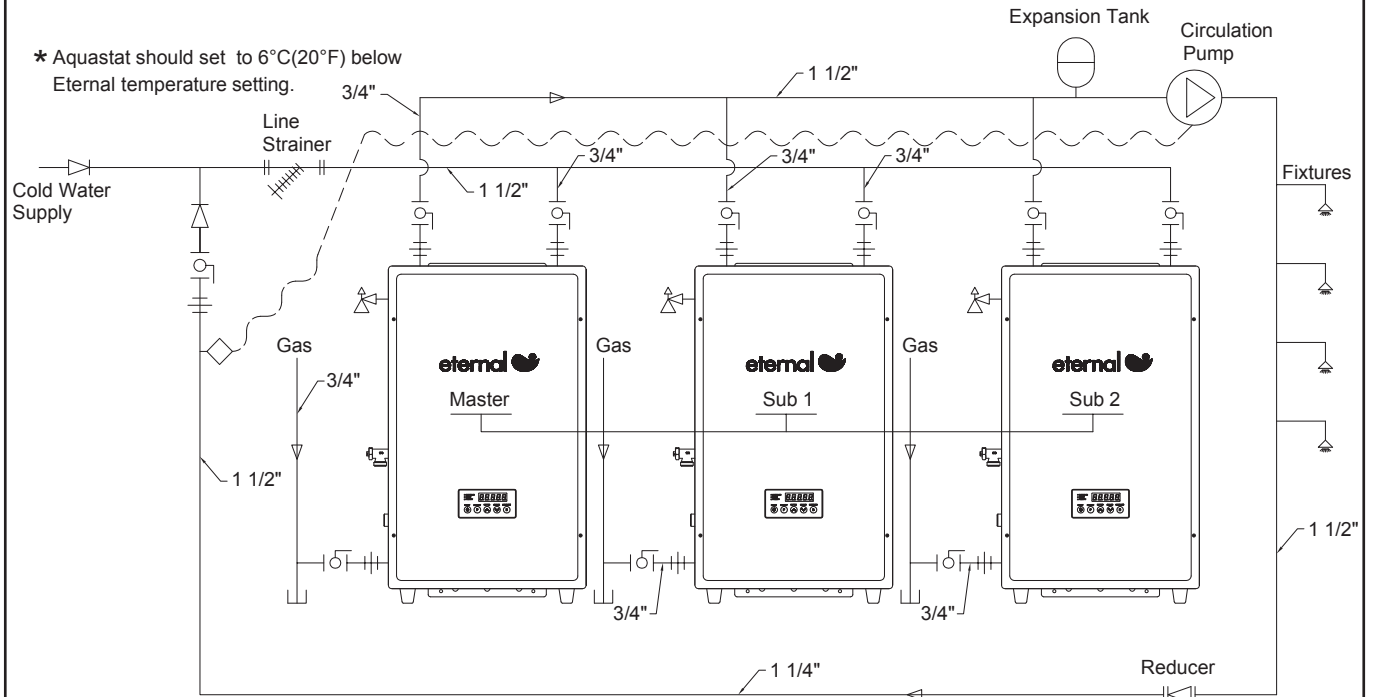
These diagrams are for reference as basic guides. Each installation should be engineered properly and compliant to Local and State Codes.

Recirculation with 2 Units manifold

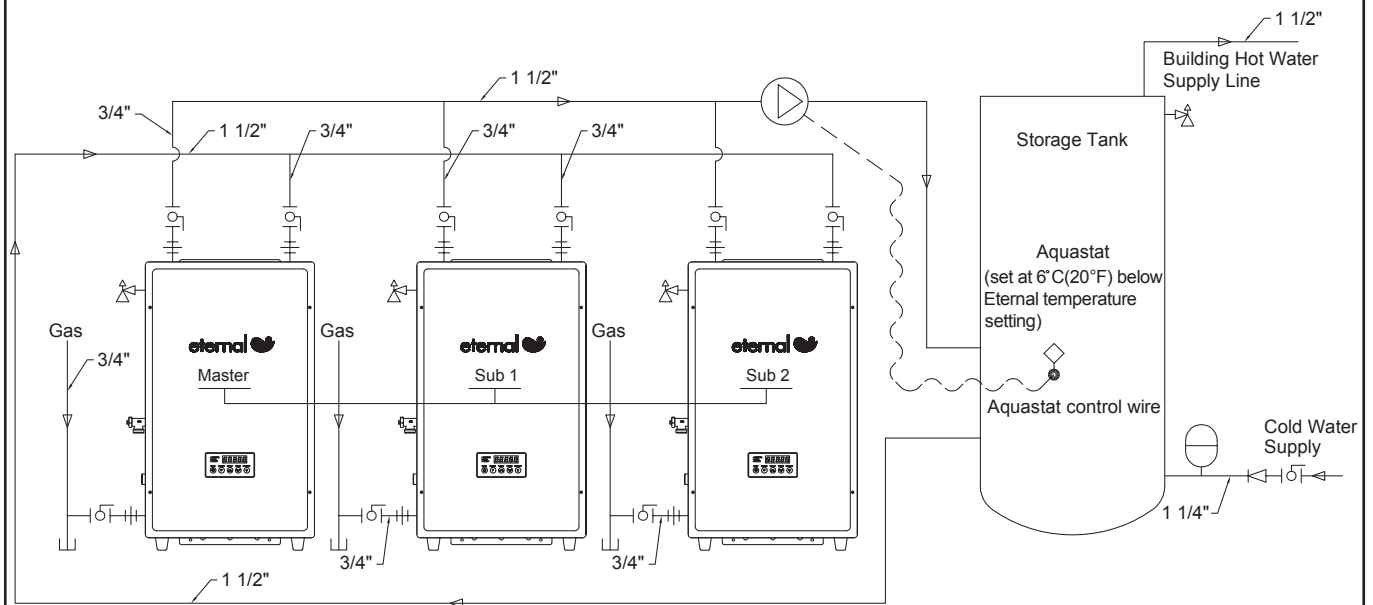


These diagrams are for reference as basic guides. Each installation should be engineered properly and compliant to Local and State Codes.

Recirculation System with Multiple Units Connection



Multiple Units Connection with Storage Back Up



These diagrams are for reference as basic guides. Each installation should be engineered properly and compliant to Local and State Codes.

Restaurant and Commercial Applications

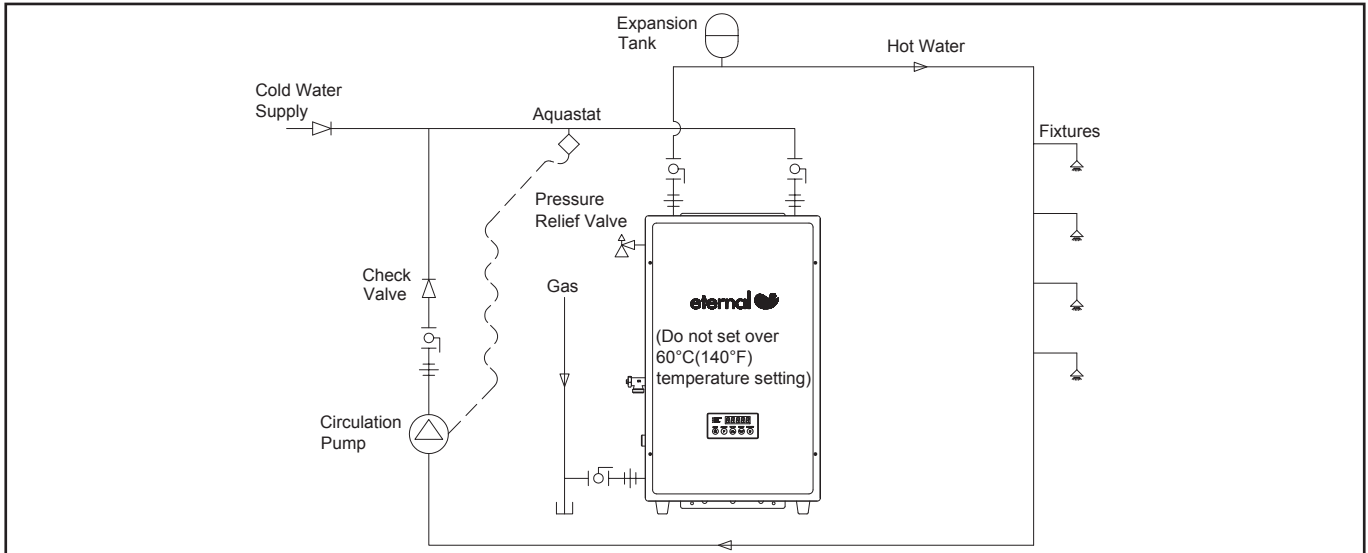


NOTICE



For restaurants or applications where rapid on/off hot water usage is frequent, i.e. handheld sprays, Eternal recommend use of recirculation pump through in the system. This recommendation is designed to prime the units for rapid usage, as the burner will not ignite during rapid on/off usage due to the intermittent nature of the application. Without a constant flow, the unit will only supply hot water from the small storage and will not recover rapidly without sufficient on-demand signal to sustain ignition.

System for rapid ON/OFF hot water usage



Note 1 : Use Aquastat pump and set at 6°C(20°F) below Eternal temperature setting. If unit is not controlling pump by internal relay.

Note 2 : Size the pump to provide a minimum of 18.9LPM(5.0GPM) through the system at 3m(10ft) of head plus piping losses.

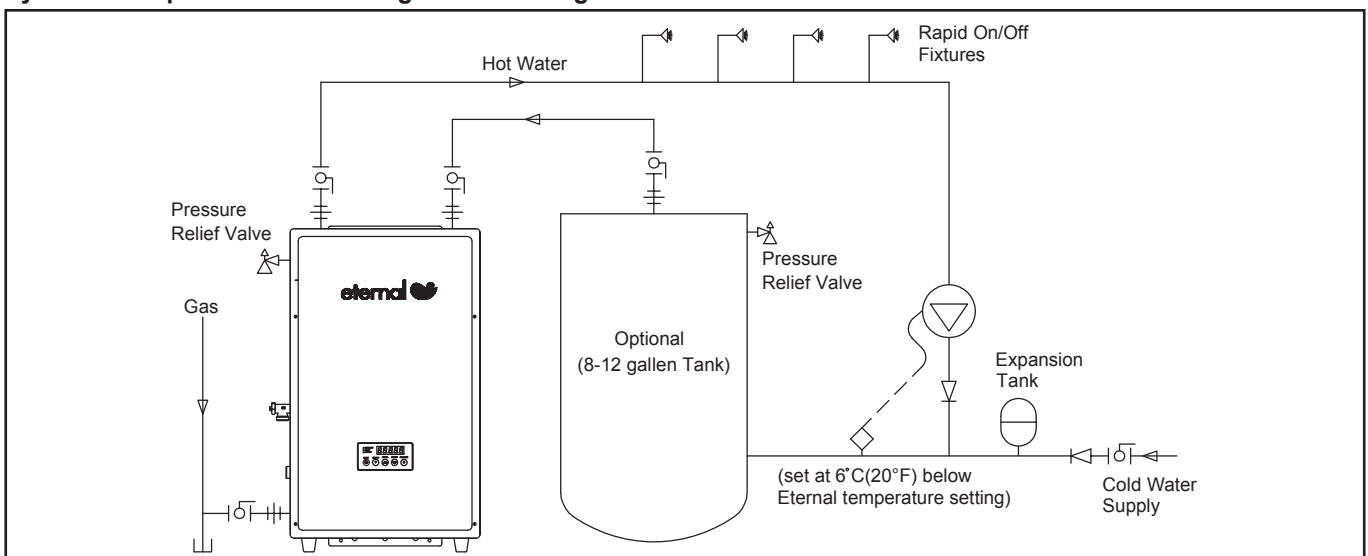


NOTICE



If there is a dishwasher that can consume a large amount of water in very short time.
For example, 22.7 litres(6 gallons) in 15 seconds, then recirculation and optional storage tank is needed.

System for rapid ON/OFF and large volume usage



Note 1 : Use Aquastat pump and set at 6°C(20°F) below Eternal temperature setting. If unit is not controlling pump by internal relay.

Note 2 : Size the pump to provide a minimum of 18.9LPM(5.0GPM) through the system at 3m(10ft) of head plus piping losses.

Note 3 : 30.3-45.4 litres(8-12 gallons) storage tank to buffer high volume short term demands and rapid ON/OFF and large volume applications.

Plumbing System for Multiple Unit Applications

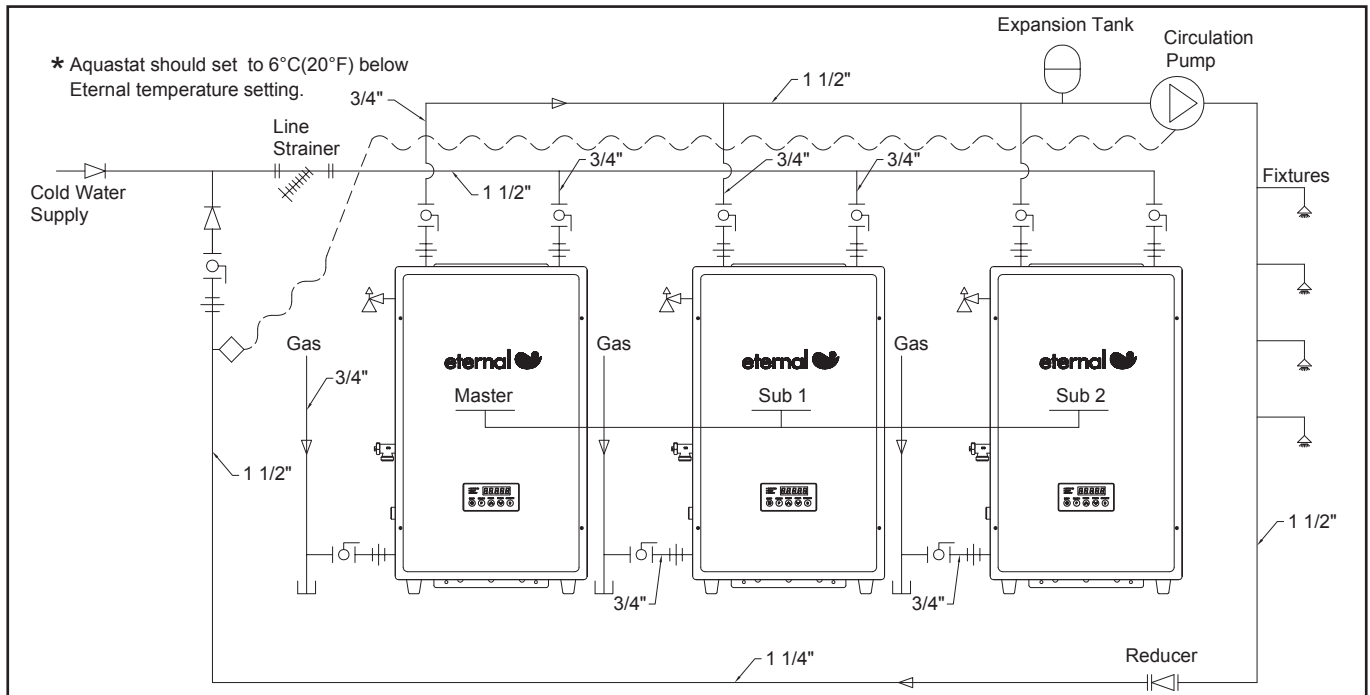


NOTICE



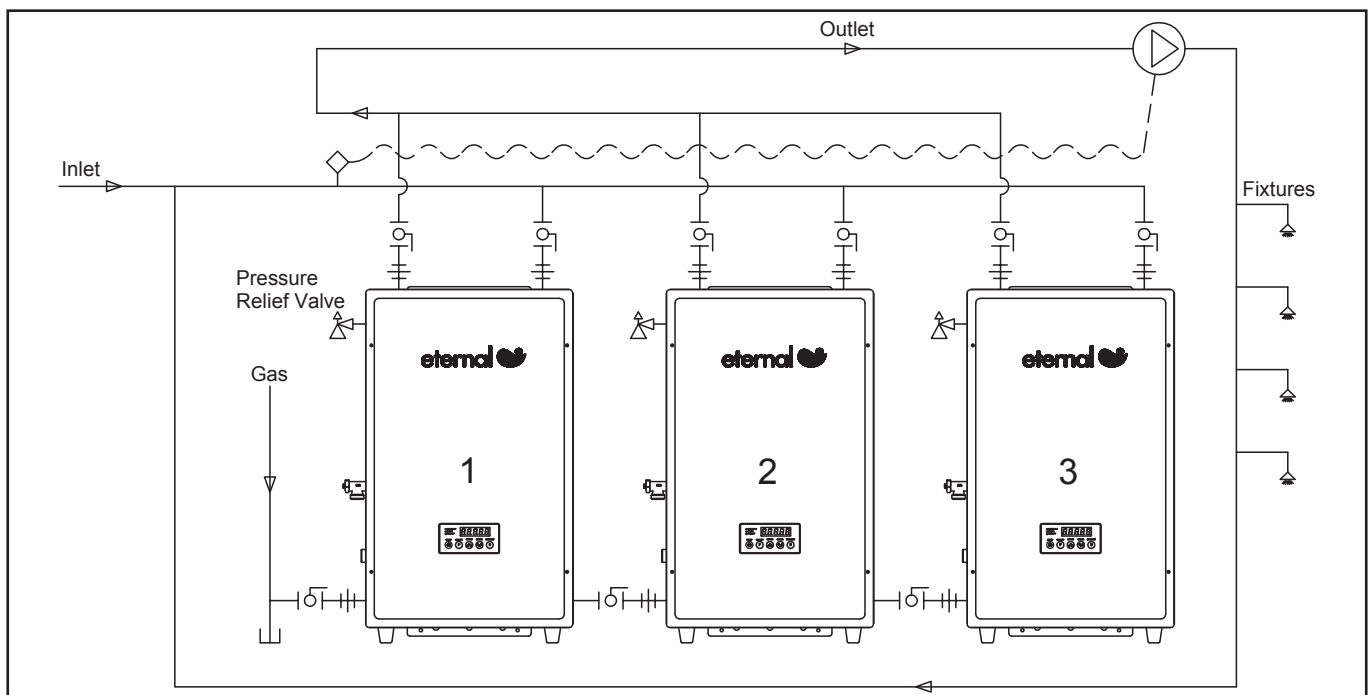
This concept can be applied when two or more heaters are used in parallel, the inlet and outlet piping should be arranged in a way that an equal flow is received from each heater under all demand conditions. With reverse return system it is easy to get parallel flow. The unit having its inlet closest to the cold water supply is piped so that its outlet will be farthest from the hot water supply line.

Reverse return system



In above drawing, there is no “path of least resistance”, water flow will be adequate in each unit. Reverse return system maintains equal pressure drop throughout the entire piping system and ensures adequate flow to all the units.

Non reverse return system - NOT RECOMMENDED



In above drawing, the difference in water pressure will cause differential water flow. More water pressure, more variations in flow rate. In the above diagram the farthest unit might have no-flow or very scarce flow.

Operating Instructions

Before Starting The System

- ☐ This water heater does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner manually.
- ☐ Before operating, make sure that a gas leak is not evident by smelling the area around the unit. Be sure to smell next to the floor because gas is heavier than air and will settle on the floor.
- ☐ Use only hand to turn the manual gas valve knob. Never use tools. If the knob will not turn by hand, do not try to repair it, call a qualified service technician. Force or attempted repair could result in a fire or explosion due to the gas leakage.
- ☐ Do not use this water heater if any part has been under water. Immediately call a qualified service technician to inspect the water heater and to replace any damaged parts.



WARNING



WHAT TO DO IF YOU SMELL GAS

- ☐ Do not try to light any appliance.
- ☐ Do not touch any electrical switch; Do not use any phone in your building.
- ☐ Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- ☐ If you cannot reach your gas supplier, call the fire department.

STARTING UP

- ☐ Once the unit has been properly installed, check the gas and water connections for leaks.
- ☐ Check for proper ventilation and combustible air supply to the water heater. Purge the gas and water lines to remove debris; then follow these steps to turn on your unit.
 1. Close the manual gas shut-off valve located on the gas line.
 2. Fully open the manual water shut-off valve on the water supply line.
 3. To ensure complete filling of the heat exchanger tank, allow air to exit by opening the nearest hot water faucet. Allow water to run until a constant flow is obtained. This will let air out of the water heater and piping.
 4. Open a hot water tap to check that water will flow to that tap. Then close the hot water tap.
 5. Fully open the manual shut-off gas valve.
 6. Plug in the 120 VAC/60Hz power supply to the water heater and turn on the unit.



CAUTION



- ☐ **Never use this hot water heater unless it is completely filled with water.**
The tank must be filled with water. Water must flow from the hot water faucet before turning "ON" gas to the water heater.
- ☐ **Do not drink water that has been inside the unit for extended period of time. Do not drink the first use of hot water from the unit in the morning.**

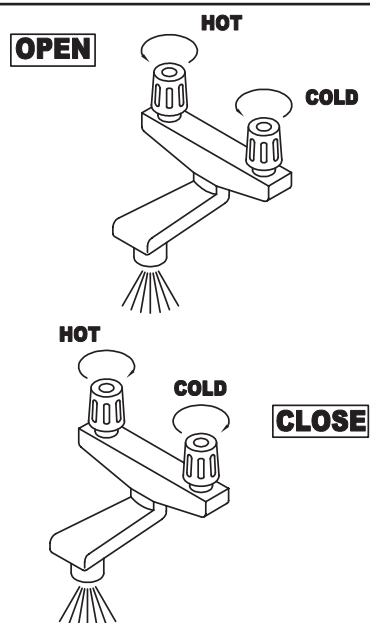
NORMAL OPERATION

To turn on your water heater

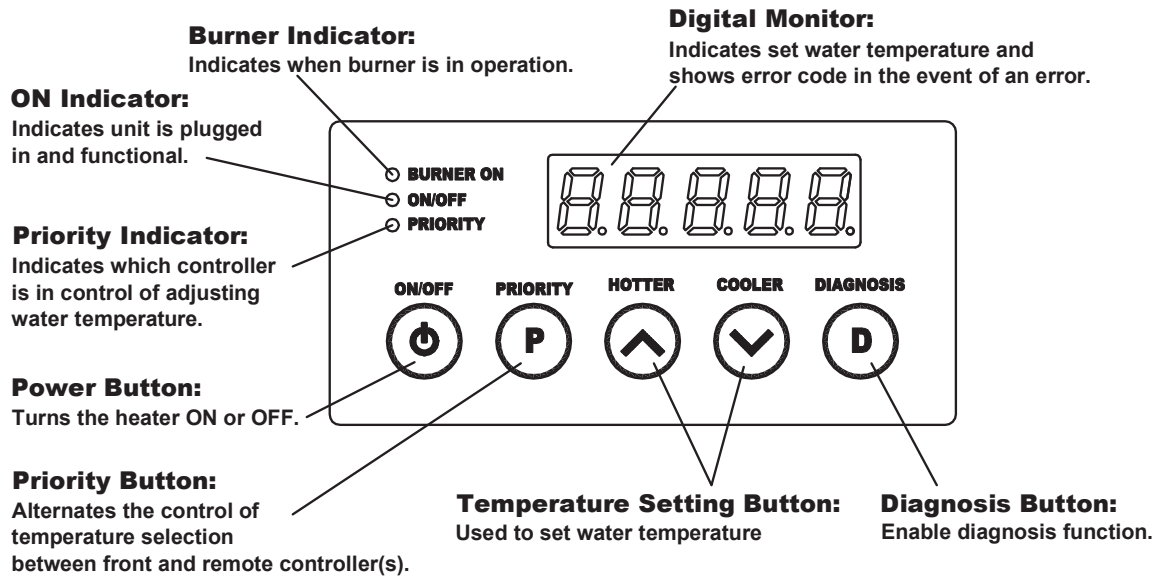
1. Open a hot water tap.
2. Burner will ignite; the indicator will light on front controller.
3. Mix cold water to get the desired water temperature at tap.
4. Maximum temperature of hot outlet can be set by controller on the front of the unit.

To turn off your water heater

1. Close the hot water tap and the water heater's burner will turn off automatically.



How To Use The Front Control Interface



1. To switch the water heater ON:

From OFF condition Press the Power Button.

- ☐ The temperature selected will be indicated on the Digital Monitor.
- ☐ The ON Indicator will light up.

2. When running the water by opening the water tap, the water heater will start the burner automatically and the Digital Monitor will show the Burner ON indicator.

3. To switch the water heater OFF:

Press the Power Button.

- ☐ The temperature selected on the Digital Monitor will go out.
- ☐ The ON Indicator will turn off.

4. To adjust water temperature:

- ☐ Press the "HOTTER" or "COOLER" Temperature Setting Button with unit ON. (Temperature setting is only adjustable when the burner is not in use.)
- ☐ The maximum water temperature setting can be limited by DIP switches. This manual setting overrides adjustable temperature settings on the front panel. Please call Grand Hall USA for DIP switch setting instructions if needed.



CAUTION



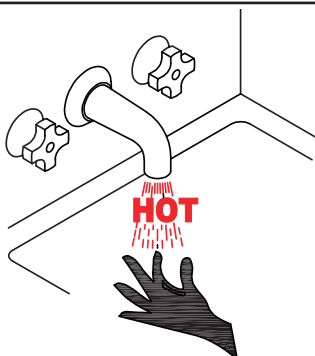
- ☐ Per some state laws – water temperature should not be set higher than 49°C(120°F). Please check with your local codes to ensure temperature is properly set.



DANGER



- ☐ Hot water heater temperature over 52°C(125°F) can cause severe burns instantly or death from scalding.
- ☐ Children, disabled and elderly are at the highest risk of being scalded.
- ☐ Feel water temperature before bathing or showering.
- ☐ Temperature limiting valves are available; please ask your professional person.



Water Temperature	Time to Produce a Serious Burn
50°C (120°F)	More than 5 minutes
52°C (125°F)	1.5 to 2 minutes
55°C (130°F)	About 30 seconds
57°C (135°F)	About 10 seconds
60°C (140°F)	Less than 5 seconds
63°C (145°F)	Less than 3 seconds
66°C (150°F)	About 1.5 seconds
69°C (155°F)	About 1 seconds

How To Use the Remote Controller

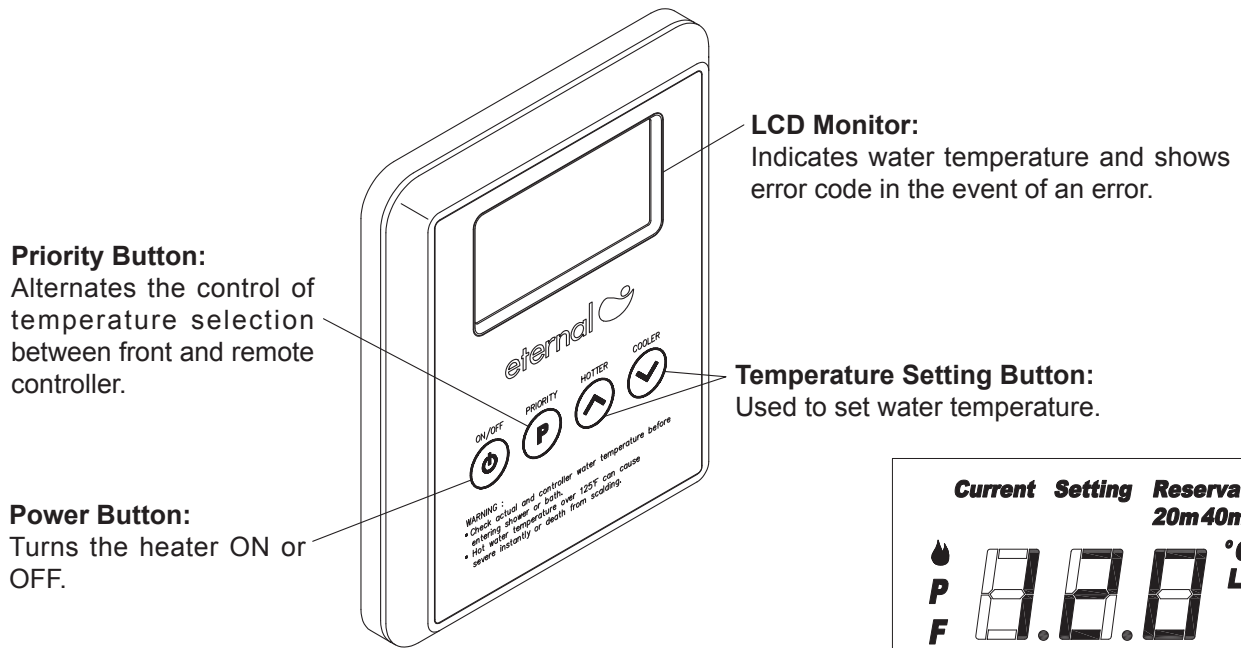


Figure 1.

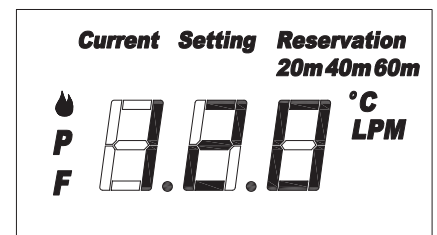


Figure 2.

1. To switch the water heater ON with Remote Controller, from OFF condition Press the Power Button.
 - The temperature selected will be indicated on the LCD Monitor on the remote controller.
2. When running the water by opening the tap, the water heater will start the burner automatically and the burner indicator will light on the remote controller. When water taps are closed, the unit will stop the burner and burner indicator will be off on the remote controller.
3. To switch the water heater OFF with remote controller, from On condition press the power button.
 - The LCD Monitor and the ON indicator should go off on the remote controller.
4. To adjust the water temperature : Press the either the Hotter(up) or Cooler(down) temperature setting button with the unit ON (temperature setting is only adjustable when the burner is not in use)
5. To lock the control at remote controller : Press the priority button with the unit ON. The priority indicator should light and now temperature can only be adjusted at the remote control; control cannot be transferred while burner is ON.



NOTICE



The maximum water temperature setting can be limited by DIP switches. This manual setting overrides remote control temperature setting.

Maintenance and Service



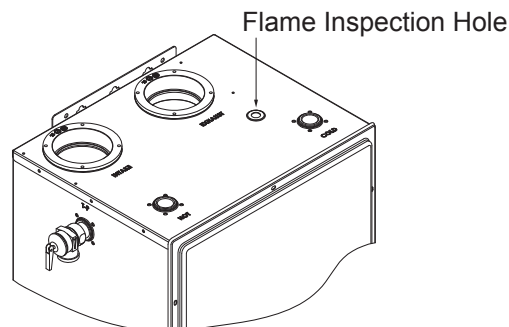
WARNING



Turn off the electrical power supply, the manual gas control valve, and the manual water control valve before servicing.

SYSTEMS AND PARTS CHECK

- ☐ The unit should be checked once a year or as necessary by a certified and trained technician. If repairs are needed, the repairs should be done by a certified and trained technician.
- ☐ The following systems and parts should be checked at least once a year.
 1. Venting system
 2. Burner
 3. Manual operation of the pressure relief valve to ensure correct operation
 4. Periodic cleaning of the water strainer.
 5. Remove the thermistor from unit and check for mineral coating - A mineral coating on the thermistor requires cleaning
- ☐ **Physical Damage:** If the water heater has been subjected to fire, flood, or physical damage, turn off the manual gas shutoff valve and do not operate the water heater again until it has been checked by qualified personnel.
- ☐ **Temperature Setting:** Hotter water increases the risk of scalding injury.
- ☐ **Venting System Inspection:** A visual inspection should be made on the venting system at least once a year.
 - Be sure the venting is properly connected to prevent escape of dangerous flue gases which could cause deadly asphyxiation.
 - Obstructions could cause improper venting. The combustion and ventilation air flow must not be obstructed.
 - Damage or deterioration which could cause improper venting or leakage of combustion byproducts.
- ☐ **Clean Up:** The flue outlet and the air intake hole on the top of the water heater should be checked. Clean as needed to prevent the entry of water, insects, rodents or other foreign materials such as fallen leaves and dust that could cause blockages. Do not obstruct the flow of combustion air and exhaust air flow.
- ☐ **Water Strainer:** The water strainer should be checked once a year. It protects valve from dirt and pipe scale. Self-clean by opening valve or hose connected to a blow-off outlet.
- ☐ **Sediment Build-up:** Unlike a typical storage tank, this heater has a self cleaning system initiated by the flow of water. Build up of sediment in faucet aerators, shower heads and screens could impair water flow and cause the water heater to deliver less than its full output, or to shut down completely. Check any of these screens or shower heads on your faucets periodically and clean as necessary.
- ☐ **BURNER IGNITION:** Water heater has automatic ignition system. Once you open a hot water tap, the computer electronically ignites the burners. You can see the burner flame via flame inspection hole.



- ☐ **Clean out of Condensate Trap:** Over time, blockage of the trap by debris may occur, when the condensate cannot be released, the unit will go into error and will shut down. When this occur, the condensate trap must be cleaned.
- ☐ **Service & Cleaning Of The Burner:** Only specially trained and authorized personnel are permitted to service the burner.

"D" button Diagnostic Function

Applicable Model:

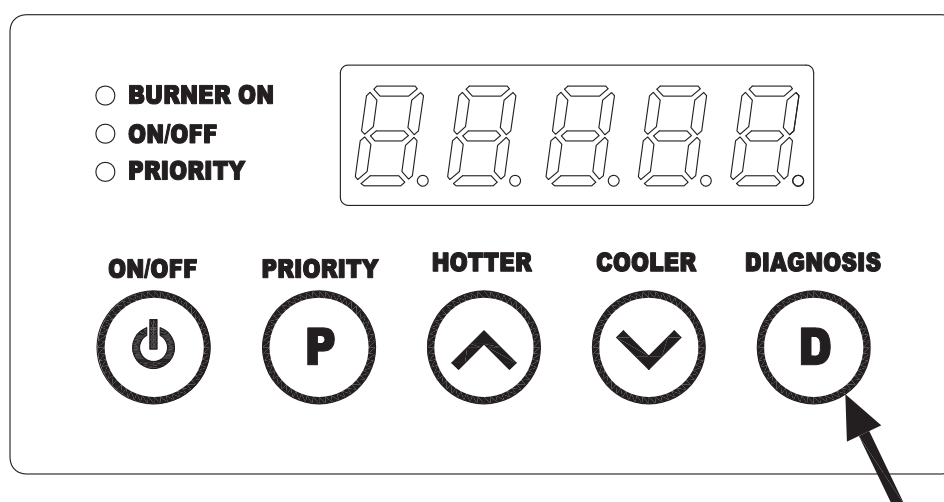
GU145(S) / 508(11,12,21,22)1145(S)

GU195(S) / 508(11,12,21,22)1195(S)

GU195(M) / 508(11,12,21,22)1195(M)

Description:

Enhanced diagnostic functions are now available with the touch of a button. Simply press the "D" button on the front control panel to access features such as: inlet and outlet temperatures, air temperature inside the chassis, fan motor RPMs, error code history and more!



Press the "D" button when the unit is in standby mode (burner off):

Diagnostic Content	Example	Explanation
Software Version for CPU A	SA 01	CPU A running version 1
Software Version for CPU B	SB 01	CPU B running version 1
E1 through E9	E2 13	Error 2 in history is code 13

Press the "D" button when the unit is firing (burner on):

Diagnostic Content	Example	Explanation
Outlet Temperature – O	O 52	Outlet is 52°C (125°F)
Heat Exchanger Temperature – H	H 57	Heat exchanger is 57°C (135°F)
Inlet Temperature – I	I 18	Inlet is 18°C (65°F)
Air Temperature – A	A 16	Air is 16°C (60°F)
Fan Motor RPM – P	P 5800	Fan is spinning at 5800 RPMs

To exit diagnostic mode, simply press at any time to return to normal display mode. You can still access the GPM flow rate data by simply pressing either the UP or DOWN button when the unit is in normal display mode and the burner is on.

DIAGNOSTICS

Before calling for service, review the following diagnostic steps first for saving time and money!

Question	Answer
Burner does not ignite when the hot water is opened.	1. Make sure that the ON/OFF button on the front or remote controller has been turned ON.
	2. If the monitor on the front or remote controller is blank, make sure the power cord is plugged and 3A fuses on the main controller in the units are good.
	3. Make sure that the water supplies to the unit. The unit activates once the inlet water flow is over 1.9LPM(0.5GPM).
	4. Make sure the cold and hot water lines are not plumbed in reverse side.
	5. Make sure that the water lines are not frozen.
	6. Make sure that the cold water and gas supply lines are opened.
Water is not hot enough.	1. Check the setting temperature on the unit is not too low
	2. Make sure that the filter in the cold water supply line is not clogged with debris.
	3. Make sure that the gas supply type is correct.
	4. Check the supply and manifold gas pressures are in accordance with specifications.
	5. Make sure that the water flow sensor with three wires has been properly connected on the top of heat exchanger.
Water is too hot.	1. Make sure that the setting temperature on the unit is not too hot.
	2. Make sure that the filter in the cold water supply line is not clogged with debris.
	3. Make sure that the gas supply type is correct
Hot water temperature fluctuates at the opened tap.	1. Make sure the filter in the cold water supply line is clean.
	2. Make sure that the gas supply type is correct.
	3. Check the supply gas pressure is sufficient.
Abnormal sounds come from unit during operation.	1. A leak of combustion gas between sealed chamber and exhaust tube inside the unit.
	2. Improper venting termination, make sure that the venting termination complies with specifications.
	3. Check the supply gas pressure is sufficient. Insufficient gas pressure will cause unstable burner flame and noise.
The blower is still operating after the combustion stops.	1. This is normal because the blower still keeps operating for 1 minute to exhaust the flue gas from the chamber once the combustion has stopped.
I Can't change the setting temperature to above 60°C (140°F) on the front controller.	1. This is a safety device to prevent from scalding. Hot water temperature over 52°C(125°F) can cause severe burns instantly or death.

DIAGNOSTICS

Self Monitoring

This unit has the ability to check its own operation continuously. If an error occurs, a message will flash on the digital monitor of the front panel.

This assists with diagnosing the error, and may enable you to overcome a problem without a service call. Please quote the code displayed when inquiring about service.

Code display	Cause	Remedy
E1	<input type="checkbox"/> Remaining flame detected	<input type="checkbox"/> Call service center
E2	<input type="checkbox"/> Ignition failure - doesn't detect flame signal	<input type="checkbox"/> Check gas line, ignitor, flame rod <input type="checkbox"/> Check wire connection of 8p wire and ignitor wire <input type="checkbox"/> Check ignition noise <input type="checkbox"/> Check gas type and manifold pressure
E3	<input type="checkbox"/> Abnormal combustion -after detection of flame signal, system lose the signal	<input type="checkbox"/> Check the gas supply in enough <input type="checkbox"/> Check the gas valve <input type="checkbox"/> Check wire connection of 8p wire and ignitor wire <input type="checkbox"/> Check gas type and pressure are correct <input type="checkbox"/> Check power supply for proper voltage
E4	<input type="checkbox"/> An outlet thermistor open	<input type="checkbox"/> Check the outlet thermistor <input type="checkbox"/> Check wire connection of 14p wire and thermistor wire
E5	<input type="checkbox"/> An outlet thermistor short	<input type="checkbox"/> Check the outlet thermistor <input type="checkbox"/> Check wire connection of 14p wire and thermistor wire
E6	<input type="checkbox"/> A H/E thermistor open	<input type="checkbox"/> Check the H/E thermistor <input type="checkbox"/> Check wire connection of 14p wire and thermistor wire
E7	<input type="checkbox"/> A H/E thermistor short	<input type="checkbox"/> Check the H/E thermistor <input type="checkbox"/> Check wire connection of 14p wire and thermistor wire
E8	<input type="checkbox"/> An inlet thermistor open	<input type="checkbox"/> Check the inlet thermistor <input type="checkbox"/> Check wire connection of 14p wire and thermistor wire
E9	<input type="checkbox"/> An inlet thermistor short	<input type="checkbox"/> Check the inlet thermistor <input type="checkbox"/> Check wire connection of 14p wire and thermistor wire
E11	<input type="checkbox"/> A DC motor failure	<input type="checkbox"/> Check DC motor <input type="checkbox"/> Check wire connection of 6p wire
E13	<input type="checkbox"/> No filled water in tank or pressure switch failure	<input type="checkbox"/> Check the water filled in tank <input type="checkbox"/> Check water pressure switch <input type="checkbox"/> Check connection of 14p wire and water pressure wire
E23	<input type="checkbox"/> Adjust control valve is not connected	<input type="checkbox"/> Check the adjust control valve movement noise <input type="checkbox"/> Check wire connection of 16p wire and adjust valve wire
E24	<input type="checkbox"/> Mixing control valve is not connected	<input type="checkbox"/> Check the mixing control valve movement noise <input type="checkbox"/> Check wire connection of 16p wire and mixing valve wire
E26	<input type="checkbox"/> Adjust control valve initialization failure	<input type="checkbox"/> Check the adjust control valve movement noise <input type="checkbox"/> Check wire connection of 16p wire and adjust valve wire
E27	<input type="checkbox"/> Mixing control valve initialization failure	<input type="checkbox"/> Check the mixing control valve movement noise <input type="checkbox"/> Check wire connection of 16p wire and mixing valve wire
E28	<input type="checkbox"/> Power line of main gas valve is open	<input type="checkbox"/> Check the thermostat <input type="checkbox"/> Check the thermal fuse <input type="checkbox"/> Check the air pressure switch <input type="checkbox"/> Check wire connection of gas valve, thermostat, thermal fuse and air pressure switch
E30	<input type="checkbox"/> Rotation of a DC fan is too high	<input type="checkbox"/> Call service center

DIAGNOSTICS

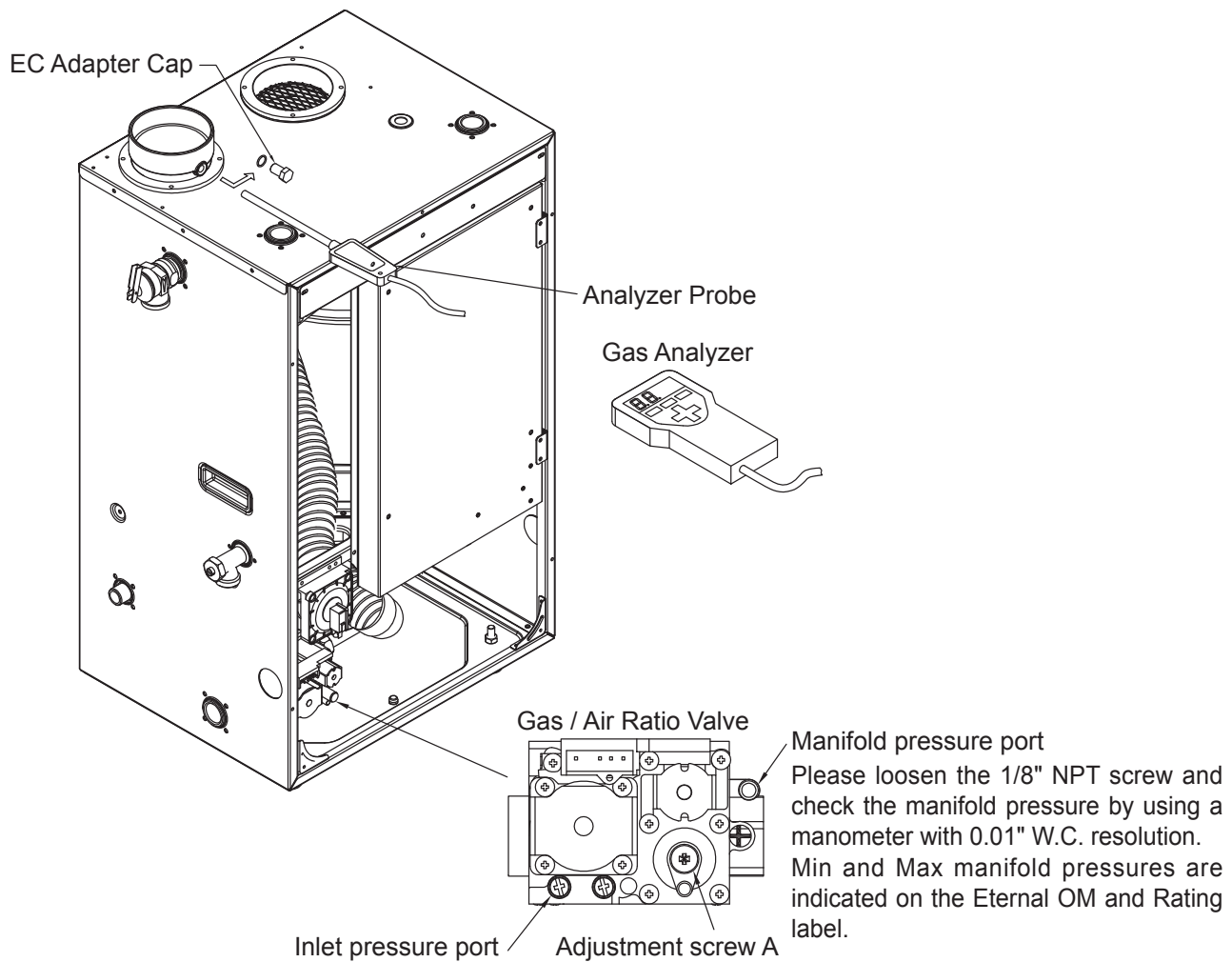
Code display	Cause	Remedy
E31	<input type="checkbox"/> Rotation of a DC fan is too low	<input type="checkbox"/> Call service center
E36	<input type="checkbox"/> A controller failure concerning gas valve	<input type="checkbox"/> Call service center
E37	<input type="checkbox"/> Communication failure with SUB CPU	<input type="checkbox"/> Call service center
E38	<input type="checkbox"/> Subsidiary RAM failure	<input type="checkbox"/> Call service center
E39	<input type="checkbox"/> A controller failure concerning Subsidiary flame signal	<input type="checkbox"/> Call service center
E40	<input type="checkbox"/> Main RAM failure	<input type="checkbox"/> Call service center
E41	<input type="checkbox"/> A controller failure concerning flame signal	<input type="checkbox"/> Call service center
E42	<input type="checkbox"/> Main ROM failure	<input type="checkbox"/> Call service center
E43	<input type="checkbox"/> Main MUX error	<input type="checkbox"/> Call service center
E47	<input type="checkbox"/> Intake Thermistor Short	<input type="checkbox"/> Check the intake thermistor <input type="checkbox"/> Check wire connection of 14p wire and thermistor wire
E48	<input type="checkbox"/> Intake Thermistor Open	<input type="checkbox"/> Check the intake thermistor <input type="checkbox"/> Check wire connection of 14p wire and thermistor wire
E49	<input type="checkbox"/> Intake Thermistor Detect Abnormal Situation	<input type="checkbox"/> Call service center
E50	<input type="checkbox"/> Room A Thermistor Short (only hydro heating)	<input type="checkbox"/> Check the room A thermistor <input type="checkbox"/> Check wire connection of 12p wire and thermistor wire
E51	<input type="checkbox"/> Room A Thermistor Open (only hydro heating)	<input type="checkbox"/> Check the room A thermistor <input type="checkbox"/> Check wire connection of 12p wire and thermistor wire
E52	<input type="checkbox"/> Room B Thermistor Short (only hydro heating)	<input type="checkbox"/> Check the room B thermistor <input type="checkbox"/> Check wire connection of 12p wire and thermistor wire
E53	<input type="checkbox"/> Room B Thermistor Open (only hydro heating)	<input type="checkbox"/> Check the room B thermistor <input type="checkbox"/> Check wire connection of 12p wire and thermistor wire
E54	<input type="checkbox"/> Current Leak on Gas Valve Power	<input type="checkbox"/> Check gas valve <input type="checkbox"/> Check connection of gas valve wire
E56	<input type="checkbox"/> Less than 0.3gpm of water flow at recirculation mode and hydro heating	<input type="checkbox"/> Check flow sensor <input type="checkbox"/> Check recirculation pump and loop <input type="checkbox"/> Check connection of 14p wire and flow sensor wire
E57	<input type="checkbox"/> Pump is not connected	<input type="checkbox"/> Check wire connection of 8p wire and pump wire <input type="checkbox"/> Check the pump
E93	<input type="checkbox"/> Master can't have any data on CAN line	<input type="checkbox"/> Check connection of 3p wire and MCU wire <input type="checkbox"/> Check connection of termination wire and resistor(120 Ω)
E94	<input type="checkbox"/> Sub can't have any signal from master	<input type="checkbox"/> Check connection of 3p wire and MCU wire <input type="checkbox"/> Check connection of termination wire and resistor(120 Ω)

NOTE: In all cases you may be able to clear the Error Message simply by turning the hot water tap OFF, then ON again. If this does not clear the Error Message, try pushing the ON/OFF button OFF, then ON again. If the Error Message still remains, contact our service center or your nearest service agent and arrange for a service call.

(800)461-4657

8am-5pm EST, Monday through Friday

How To Check Gas Combustion



WARNING



The combustion testing and adjustments must be performed by a qualified installer, service agency or the gas supplier. All combustion analyzer must be performed with calibrated equipment to ensure proper reading and accuracy.

If the combustion levels are not within the range given in Table 1 for the firing rate, shut the unit and contact Eternal Engineering support team. Failure to comply with this requirement could result in severe personal injury, death or substantial property damage.

After setting the CO level should not exceed 100 ppm for Natural gas or not exceed 200 ppm for Propane (LPG).

Recommended Combustion Levels

Setting values O ₂ / CO ₂				
Model	Gas type			
	Natural gas		Propane gas	
	O ₂	CO ₂	O ₂	CO ₂
GU145(S)	3.0 - 6.5%	8.0 - 10.0%	3.7 - 6.9%	9.0 - 11.0%
GU195(S,M)	3.0 - 6.5%	8.0 - 10.0%	3.7 - 6.9%	9.0 - 11.0%

(Table 1)

How To Check Gas Combustion

Setting procedure for high firing

Unscrew the EC adopter cap on vent collar (see to above diagram) and connect the flue gas analyzer.

- **Set to full load:** with the unit at 55°C(130°F) or higher, force the unit into high fire by opening demand of at least 26.5 LPM (7GPM) water flow rate.
- Wait 10 seconds for modulation to stabilize with the full-load fan speed, measure the O₂/CO₂ percentage and compare this to the values in table 1.
- If the values are not in accordance with the table 1 then correct the gas/air ratio valve using the adjusting screw A on gas valve.
- If the value is too low turn the adjusting screw A clockwise; this increases the gas rate - if the value is too high turn the screw anti clockwise which decrease the gas rate.
- Check the flame through the sight glass which should be stable with a regular flame distribution.

Setting procedure for low firing

- **Set to low load:** Turn dipswitch #3 in group 3 to ON and throttle demand down to no more than 7.6LPM (2 GPM) water flow rate.
- Wait at least 10 seconds for modulation to stabilize with the low-load fan speed, measure the O₂/CO₂ percentage and compare this to values in table 1.
- If the values are not in accordance with the table then correct the gas/air ratio valve using the adjusting screw A on gas valve.
- If the value is too low turn the adjusting screw A clockwise; this increases the gas rate - if the value is too high turn the screw anti clockwise which decrease the gas rate.
- Flip dipswitch #3 in group 3 to OFF.
- Cold flush the unit and let it take itself through at least 1 cycle on standby fire for boot up diagnostics.
- Check the flame through the sight glass which should be stable with a regular flame distribution.
- Reinstall the flue stack cap when finished testing.



NOTICE



Only make small adjustments of the adjusting screw maximum 1/8 turns when setting O₂/CO₂.

Ensure that the analyzing probe has a gas tight seal in the sampling point with the probe end in the centre of the flue duct.

Repeat the "test at high firing" and "test at low firing" as often as necessary until the correct values are achieved without further adjustments.



NOTICE



HOW TO CHECK GAS SUPPLY PRESSURE

1. Turn off power source and turn off gas supply to the unit.
2. Remove the front cover from the unit.
3. Loosen the gas supply pressure test port screw and connect manometer to this port; turn on the gas to the water heater.
4. Turn the water heater on and open multiple taps to force unit into high fire; check gas supply pressure at the test port with a manometer with unit in high fire.

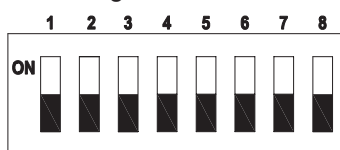


NOTICE

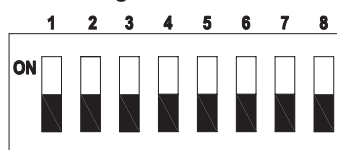


HOW TO CHECK MINIMUM MANIFOLD GAS PRESSURE

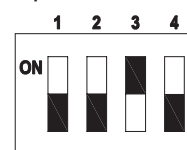
1. Turn the water heater ON with 7.6LPM (2GPM) of hot water flowing.
 2. Set the dip switch group 3 and number 3 ON.
- Check manometer reading of low fire manifold pressure against unit combustion specifications.



GROUP 1



GROUP 2



GROUP 3



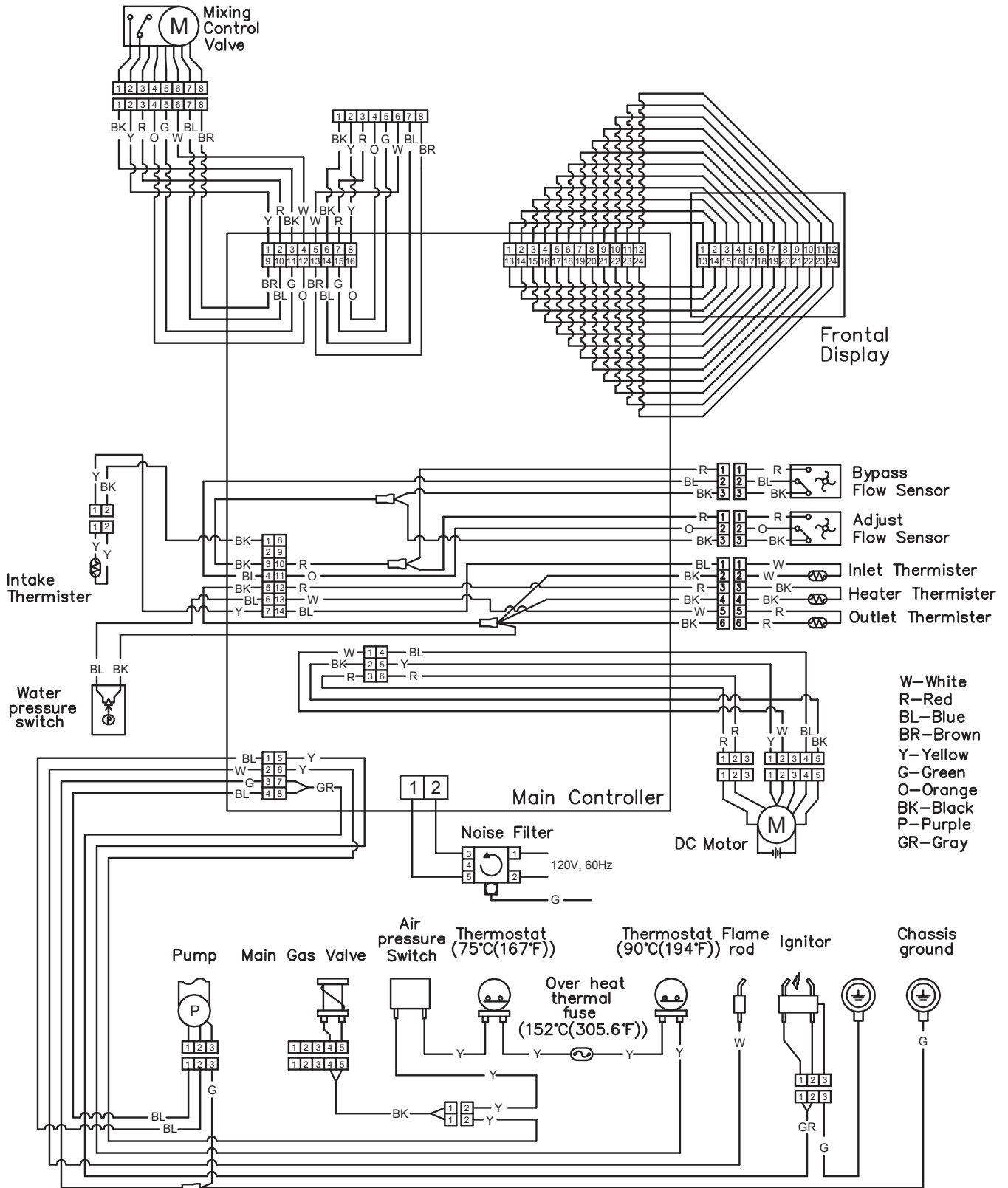
WARNING



- ☐ Manifold Gas Pressure should be adjusted on low and high fire.
- ☐ If gas supply pressure drops below 8.7mbar(3.5"wc) unit will not have enough gas volume for max fire!

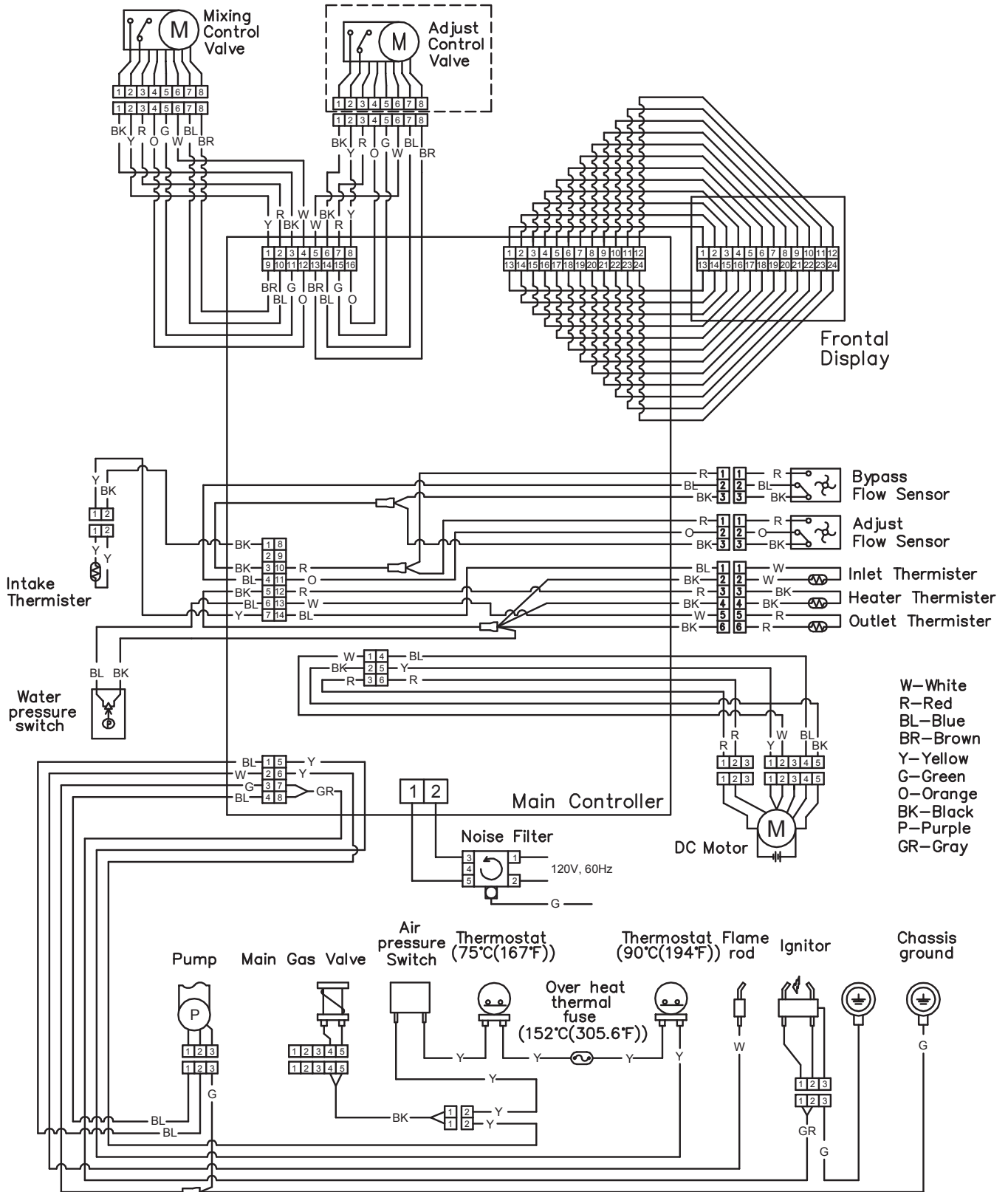
Wiring and Connection Diagram

Wiring Diagram MODEL : GU145(S) / 508(11,12,21,22)1145(S)
GU195(S) / 508(11,12,21,22)1195(S)



Wiring and Connection Diagram

Wiring Diagram MODEL : GU195(M) / 508(11,12,21,22)1195(M)



Eternal Water Heater Limited Warranty

Grand Hall will warrant to the ORIGINAL INSTALLED LOCATION of this gas water heater that it will be free of defects in material and workmanship for set period below from the date of purchase when installed and operated in accordance with the instructions in the manual and all local/provincial/federal codes.

Heat Exchanger Tank - 15 Years Residential / 10 Years Commercial No Leak Warranty

All Parts - 3 Years Limited Warranty

Grand Hall will require reasonable proof of your date of purchase. Therefore, you should send the owner registration card to the following address, Marathon International, 1815 Sismet Road, Mississauga, Ontario, Canada, L4W1PC or register online at www.wallhungboilers.com. Save your receipt in case it is required as proof of purchase.

This Limited warranty is limited to repair or replacement of parts, at Grand Hall's option that proved to be defective under normal use utilizing potable water.

Grand Hall may require the return of defective parts for examination before issuing replacement parts or repairs. If you are required to return defective parts, transportation charges must be prepaid.

No returns will be accepted without prior authorization from Grand Hall.

Upon examination and to Grand Hall's satisfaction, if the original part is proven defective Grand Hall may approve your claim and elect to replace such parts without charge. You are responsible for shipping charges of such replacement parts.

This Warranty does not cover any failures or operating difficulties due to accident, abuse, misuse, alteration, misapplication, vandalism, improper installation, maintenance or service, as set out in this Operator's Manual.

Deterioration or damage due to severe weather conditions such as hail, hurricane, earthquakes, tsunamis, tornadoes, Acts of God or terrorism, discoloration due to exposure to chemicals either directly or in the atmosphere, is not covered by this Limited Warranty.

Only a licensed professional can install Eternal units for safety and code compliance. Venting and plumbing codes can vary by location. Installation instructions and all applicable codes must be followed or property damage, severe injury, or death can result. Failure to use a licensed plumber or contractor, follow venting, plumbing, and building codes; or follow installation instructions may be unlawful and will void the product warranty. Grand Hall is not responsible for any costs incurred for repairing any problems resulting from failure to follow installation instructions or applicable codes.

All replacement parts will carry out the remainder of warranty on the original parts.

To Obtain Warranty

Call 800-461-4657

8am - 5pm EST

Warranty Restrictions

- This warranty applies only when the water heater is used in Canada.
- This warranty gives you specific legal rights, and you may also have other rights which vary from province to province.
- This warranty does not cover damage resulting from use with non-potable water or water with high hardness level exceeding 450ppm. Water softener is recommended for areas with hardness over 200ppm.

Internet Sales Policy

We encourage the use of the Internet for researching product attributes and for finding qualified installers that can properly size and service Eternal Hybrid Water Heaters. However, in the interest of safety and performance, our products must be installed by licensed professionals since the connections to the equipment involve electrical, gas and water lines.

Grand Hall does not support the sale of Eternal Hybrid Water Heaters to consumers over the Internet; including but not limited to auction sites. Such sales are strictly prohibited and no warranty is offered on Eternal Hybrid Water Heaters purchased over the Internet. Websites or auctions claiming that any Eternal Hybrid Water Heater purchased online is covered by Grand Hall's warranty are incorrect and falsely advertising.

This policy is necessary to ensure that installations are safe and comply with applicable laws, rules, and building codes at the federal, province, and local levels. Failure to comply with this policy could lead to violations of applicable laws that require licensing and permitting for installations of water heaters.

Manufacturer:

Grand Hall Enterprise Co., Ltd.

9th Fl., No.298, Rueiguang Rd., Neihu,
Taipei, Taiwan (114)